COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Rubenbauer, J. Z. *Anorg. Allg. Chem.* 1902, *30*, 331-7.
VARIABLES: Concentration of Sodium hydroxide.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in aqueous NaOH.

g Na/20 ccm	C_{NaOH}/mol dm^{-3} [a]	g Zn/20 ccm	C_{ZnO}/mol dm^{-3} [a]
0.1012	0.220	0.0040	0.00306
0.1978	0.430	0.0150	0.0115
0.4278	0.930	0.0442	0.0338
0.6670	1.451	0.1771[b]	0.135
0.9660	2.101	0.9630[b]	0.736
1.4951	3.252	0.2481	0.190
2.9901	6.503	0.3700	0.283

[a] Calculated by the compiler.

[b] This result appears to be an error.

The author says that shaking the mixture for 10 hours gave the same zinc content as obtained after shaking for only 5 hours.

The author further notes that in the most concentrated NaOH solution the $Zn(OH)_2$ dissolved very rapidly but then almost immediately precipitated out of solution. This transient zinc content was about 10 times the value at equilibrium.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The mixtures of moist $Zn(OH)_2$ and aqueous NaOH were shaken vigorously for about 5 hours. A small sample was filtered, and the filtrate was analyzed for zinc content by precipitating the zinc as $ZnCO_3$, heating it, and weighing the ZnO. No temperature is stated in the article but it appears that the solubility values were determined at room temperature.	$Zn(OH)_2$ was prepared by adding NaOH to aqueous $ZnSO_4$. The precipitate was washed and then dried on a clay plate. The NaOH was prepared from metallic Na and was carbonate-free.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Wood, J. K. *J. Chem. Soc.* 1910, *97*, 878-90
VARIABLES: Concentration of NaOH at 25°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in aqueous NaOH at 25°C.

mol Zn(II) dm^{-3}	mol Na(I) dm^{-3}
0.00311	0.2636
0.0057	0.3871
0.0129	0.5414
0.0425	0.9280

From the first two data points in the above Table the author calculates the solubility of $Zn(OH)_2$ in water at 25°C to be 0.00078 mol dm^{-3}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally and was determined by repeated analyses. The analytical procedures are not mentioned or described.	The $Zn(OH)_2$ was prepared by precipitation from $ZnSO_4$ with NaOH. The precipitate was washed thoroughly before being used. The source or purity of the other materials is not mentioned.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Chromium(VI) oxide; CrO_3; [1333-82-0] (3) Water; H_2O; [7732-18-5]	Groger, M. *Z. Anorg. Chem.* 1911, *70*, 135-44.
VARIABLES: Concentration of CrO_3 at 25°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous CrO_3 at 25°C.

C_{CrO_3}/mol dm^{-3}	C_{ZnO}/mol dm^{-3}	C_{CrO_3}/mol dm^{-3}	C_{ZnO}/mol dm^{-3}
0.00010	0.00016	0.933	0.510
0.00010	0.00016	1.01	0.552
0.00010	0.00016	1.51	0.812
0.00604	0.00503	1.92	1.03
0.0214	0.0142	1.92	1.03
0.0419	0.0275	2.85	1.51
0.114	0.0717	3.92	2.06
0.115	0.0723	4.50	2.34
0.222	0.131	4.61	2.41
0.314	0.183	4.63	2.42
0.431	0.247	4.75	2.48
0.575	0.328	5.74	2.94
0.665	0.372	6.60	3.37
0.667	0.373	7.69	3.90
0.706	0.394	8.79	4.35
		9.70	4.78

Five individual zinc chromates were identified by the author: $4ZnO \cdot CrO_3 \cdot 3H_2O$; $3ZnO \cdot CrO_3 \cdot 2H_2O$; $4ZnO \cdot 2CrO_3 \cdot 3H_2O$; $3ZnO \cdot 2CrO_3 \cdot H_2O$; $ZnO \cdot CrO_3 \cdot H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A slurry of ZnO and chromic acid was prepared and placed in a flask. The mixture was shaken in a thermostat at 25°C for 3 days The solid and liquid phases were separated from each other by filtration. The chromium content was determined by iodometric titration. The ZnO content was determined indirectly. A measured amount of solution was placed in a crucible together with a weighed amount of ZnO and evaporated on a water bath. The precipitate was dried, weighed, and analyzed for Cr_2O_3. This value, together with the known amount of Cr in the solution, was used to calculate the ZnO content of the solution.

SOURCE AND PURITY OF MATERIALS:

No details are given.

ESTIMATED ERROR:

No details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Phosphorus(V) oxide; P_2O_5; [1314-56-3] (3) Water; H_2O; [7732-18-5]	Eberly, N. E.; Gross, C. V.; Crowell, W. S. *J. Am. Chem. Soc.* 1920, *42*, 1433-9.
VARIABLES: Concentration of P_2O_5 and temperature.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in phosphoric acid solutions at 25°C.

mass % P_2O_5	mass % ZnO	mass % P_2O_5	mass % ZnO
5.08	2.38	28.70	13.48
9.76	4.65	30.09	14.16
12.42	6.13	32.55	15.40
13.52	6.56	33.79	15.82
14.00	6.74	37.15	17.30
14.15	6.92	37.76	17.65
14.37	6.97	39.61	18.04
14.83	7.34	42.05	16.14
15.98	7.71	44.53	13.20
17.15	8.26	48.70	9.58
18.33	8.73	52.25	7.64
22.75	10.74	55.97	7.23
26.48	12.47		

In no instance was ZnO the solid phase. All solid phases were types of zinc phosphate: $Zn_3(PO_4)_2 \cdot 4H_2O$; $ZnHPO_4 \cdot 3H_2O$; $Zn(H_2PO_4)_2 \cdot 2H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Slightly supersaturated solutions were made up and allowed to form a precipitate on standing (with occasional agitation) in a constant temperature bath. Analyses were repeated at 2 week intervals until constant results were obtained. Phosphoric acid was determined gravimetrically as magnesium pyrophosphate. ZnO content was determined by titration with $K_4Fe(CN)_6$. The composition of the solid was determined by the Schreinemakers' wet-residue method.	U. S. P. grade materials were used.
	ESTIMATED ERROR: The temperature was controlled to within 0.1°C at 25°C and to within 0.25°C at 37°C. No other details are given.
	REFERENCES:

COMPONENTS	ORIGINAL MEASUREMENTS
(1) Zinc oxide; ZnO; [1314-13-2] (2) Phosphorus(V) oxide; P_2O_5; [1314-56-3] (3) Water; H_2O; [7732-18-5]	Eberly, N. E.; Gross, C. V.; Crowell, W. S. *J. Am. Chem. Soc.* 1920, *42*, 1433-9.

EXPERIMENTAL VALUES, contd. - - - -

Solubility of ZnO in phosphoric acid solutions at 37°C.

mass % P_2O_5	mass % ZnO	mass % P_2O_5	mass % ZnO
4.87	2.08	37.80	15.78
9.46	4.12	39.93	16.12
13.60	6.27	42.42	15.81
18.13	8.78	42.65	16.82
19.48	9.66	44.89	17.83
20.32	10.16	46.11	18.05
21.96	10.88	46.41	14.74
26.75	13.26	48.99	12.55
29.65	14.77	51.35	11.26
33.39	17.06	51.92	11.12
34.58	17.92	54.32	10.82
36.13	16.00		

In no instance was ZnO the solid phase. The only solid phase identified was $ZnHPO_4 \cdot H_2O$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Goudriaan, F. *Proc. Acad. Sci. Amsterdam* 1919, *22*, 179-89; *Rec. trav. Chim.* 1920, *39*, 505-14.
VARIABLES: Concentration of NaOH at 30.0°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous NaOH at 30.0°C.

mass % Na_2O	mass % ZnO	mass % H_2O	Solid phase
11.8	2.6	85.6	ZnO
17.4	5.0	77.6	"
24.6	12.6	62.8	"
24.9	12.9	62.2	"
23.7	11.3	65.0	"
27.3	16.0	56.7	"
27.8	16.5	55.7	$ZnO + Na_2O \cdot ZnO \cdot 4H_2O$
28.0	14.9	57.1	$Na_2O \cdot ZnO \cdot 4H_2O$
33.5	10.9	55.6	"
36.7	9.5	53.8	"
31.8	11.7	56.5	"
30.1	13.2	56.7	"
33.2	11.2	55.6	"
31.5	11.8	56.7	"
36.9	10.1	53.0	"
34.7	10.4	54.9	"
36.1	10.2	53.7	"
36.8	9.9	53.3	"
39.2	9.7	51.1	$Na_2O \cdot ZnO \cdot 4H_2O + Na_2O \cdot 3H_2O$
39.4	9.0	51.6	$Na_2O \cdot 3H_2O$
39.6	7.2	53.2	"
40.7	2.0	57.3	"
40.5	1.6	57.9	"
40.9	1.1	58.0	"
41.9	0.0	58.1	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally. No mention is made of any of the analytical procedures that were used. The composition of the solid phase was determined by the Schreinemakers' wet-residue method.	The NaOH was prepared from metallic sodium. The ZnO was prepared by heating $ZnCO_3$ or by heating the precipitate formed when the calculated quantity of NH_4OH was added to a solution of $Zn(NO_3)_2$. Distilled water was boiled before use.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Goudriaan, F. *Proc. Acad. Sci. Amsterdam* 1919, 22, 179-89; *Rec. trav. Chim.* 1920, 39, 505-14.
VARIABLES: Concentration of NaOH at 30.0°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES: Solubility of $Zn(OH)_2$ in aqueous NaOH at 30.0°C.

No.	mass % Na_2O	mass % ZnO	mass % H_2O	Solid phase
26	24.6	12.5	62.9	ZnO
27	19.9	15.2	64.9	$Zn(OH)_2$
28[a]	4.6	1.0	96.4	"
29	4.5	0.4	95.1	ZnO
30	13.7	7.2	79.1	$Zn(OH)_2$
31	10.1	4.7	85.2	"

[a] These mass % values do not add up to 100.

The author maintains that $Zn(OH)_2$ is metastable with respect to ZnO and the results in the above Table are intended to support this claim. $Zn(OH)_2$ was the solid phase added to each of the solutions in the above Table. In Nos. 27, 28, 30 and 31 only 24 hours elapsed before analysis and in each case the solid phase is still $Zn(OH)_2$. In No. 26 at least 2 weeks elapsed before the analysis was made, and in No. 29 3 weeks elapsed before the filtrate was removed and analyzed. During this period of standing the solid phase changed to ZnO.

Where $Zn(OH)_2$ is the solid phase, the solubility values of Zn(II) in solution are much larger than for solutions made by dissolving ZnO in aqueous NaOH. When ZnO is the solid phase (Nos. 26, 29) the solubility values are the same as for solutions in which ZnO is dissolved in aqueous NaOH.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally. No mention is made of any of the analytical procedures. The composition of the solid phase was determined by the Schreinemakers' wet-residue method.	NaOH was prepared from metallic sodium. Distilled water was boiled before being used. The $Zn(OH)_2$ was prepared by dropwise addition of a solution of $ZnSO_4$ to a KOH solution until a turbidity persisted. On standing, this solution gave a heavy, sandy precipitate of $Zn(OH)_2$.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Dietrich, H. G.; Johnston, J. J. *Am. Chem. Soc.* 1927, *49*, 1419-31.
VARIABLES:	**PREPARED BY:**
Concentration of NaOH and temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in NaOH solutions.

mol NaOH dm^{-3}	$1000R^a$	mol NaOH dm^{-3}	$1000R^a$
temp., 25°C.		temp., 0°C.	
0.1554	7.513	0.5652	22.29
0.3416	16.50	1.204	47.02
0.5430	25.39	1.781	68.94
0.8641	40.17	2.398	89.37
1.167	55.21	3.003	114.2
1.395	65.52		
2.700	125.3	temp. 35°C.	
3.364	150.4		
6.69	279.7	0.5679	29.60
		0.9618	49.32
		1.383	68.84
		1.710	86.54
		2.456	122.9

[a] R = number of moles of $Zn(OH)_2$ per mole of alkali.

Extrapolation of the values in the above Table gives the solubility of $Zn(OH)_2$ in water at 25°C as 2×10^{-5} mol/kg H_2O.

By measuring the e.m.f. of the cell: $Zn|Zn(OH)_2|NaOH\ (aq)|HgO|Hg$, the authors obtained a value of 3.3×10^{-17} for K_s^o at 25°C.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached from undersaturation and from supersaturation. The mixture was rotated in a thermostat for 24 hours, by which time equilibrium (as determined by analysis) had been reached. A portion of the filtrate was added to excess HCl and back-titrated with NaOH. The zinc content was determined by electrometric titration with $K_4Fe(CN)_6$ (1).	$Zn(OH)_2$ was prepared by adding the calculated quantity of NH_4OH to a solution of a zinc salt, separating and washing the precipitate, dissolving the precipitate in excess NH_4OH, and then allowing the NH_3 to evaporate. The NaOH was carbonate-free. Distilled water was used throughout.
	ESTIMATED ERROR:
	The average deviation was below 0.5%.
	REFERENCES:
	1. Willard, H. H.; Fenwick, F. *J. Am. Chem. Soc.* 1922, *44*, 2504, 2516.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Ammonium hydroxide; NH_4OH; [1336-21-6] (3) Water; H_2O; [7732-18-5]	Dietrich, H. G.; Johnston, J. *J. Am. Chem. Soc.* 1927, *49*, 1419-31.
VARIABLES: Concentration of ammonium hydroxide and temperature.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in NH_4OH solutions.

mol NH_4OH dm^{-3}	$1000R^a$	mol NH_4OH dm^{-3}	$1000R^a$
temp., 25°C		temp. 0°C.	
0.1569	4.916	0.5099	20.07
0.2402	7.584	1.152	32.78
0.5527	15.32	1.517	40.73
0.6468	17.64	1.739	43.14
1.088	26.11	2.455	52.13
1.265	29.44	3.344	62.32
1.697	34.06		
2.416	42.85	temp., 35°C	
3.753	51.55		
5.086	55.90	0.4781	12.55
		0.5049	13.11
		1.035	22.58
		1.753	31.18
		2.432	37.68

[a] R = number of moles of $Zn(OH)_2$ per mole of alkali.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached from undersaturation and from supersaturation. The mixtures were rotated in a thermostat for 24 hours, by which time equilibrium (as determined by analysis) had been reached. A portion of the filtrate was added to excess HCl and back-titrated with NaOH. The zinc content was determined by electrometric titration using $K_4Fe(CN)_6$ (1).	$Zn(OH)_2$ was prepared by adding the calculated quantity of NH_4OH to a solution of a zinc salt, separating and washing the precipitate, dissolving the precipitate in excess NH_4OH, and then allowing the NH_3 to evaporate. Chemically pure NH_4OH was distilled. Distilled water was used as solvent.
	ESTIMATED ERROR: The average deviation was below 0.5%.
	REFERENCES: 1. Willard, H. H.; Fenwick, F.; *J. Am. Chem. Soc.* 1922, *44*, 2504, 2516.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Müller, E.; Müller, J.; Fauvel, A. *Z. Elektrochem.* 1927, *33*, 134-44.
VARIABLES:	**PREPARED BY:**
Concentration of NaOH at 30°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in NaOH solutions at 30°C.

mol NaOH dm^{-3}	mol $Zn(OH)_2$ dm^{-3} [a]
2.11	0.073
4.05	0.333
6.09	0.702
8.27	1.152[b]
8.27	1.190[b]
9.81	1.470[c]
9.81	1.522[c]
12.12	2.310
14.50	3.027
16.04	3.647

[a] These values were determined after 60 days of shaking.

[b,c] In the second set of results in each of these pairs, a larger amount (almost double) of solid phase was added to the original NaOH solutions.

The authors stress that the NaOH concentrations include that which has reacted with the ZnO. The values are not necessarily the equilibrium concentrations of NaOH.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally with agitation. Zinc content was determined by potentiometric titration with $K_4Fe(CN)_6$. Total alkali content was determined by titration with HCl.

SOURCE AND PURITY OF MATERIALS:

The NaOH was carbonate-free. ZnO was produced by heating the precipitate formed when NaOH was added to a solution of pure $Zn(NO_3)_2$. The water was boiled before use.

ESTIMATED ERROR:

The precision of the zinc titration was 0.6%. No other details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Müller, E.; Müller, J. Fauvel, A. *Z. Elektrochem.* 1927, *33*, 134-44.
VARIABLES:	**PREPARED BY:**
Concentration of sodium hydroxide at 30°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in NaOH solutions at 30°C.

mol NaOH dm^{-3}	mol $Zn(OH)_2$ dm^{-3} [a]	nature of solid phase
3.97	0.595	crystalline
7.15	2.271[b]	crystalline
9.87	1.883[b]	amorphous

[a] These values were determined after the solutions had been shaken for two weeks.

[b] In this experiment the $Zn(OH)_2$ content after 1 day was 4.363 mol dm^{-3} and the precipitate was still crystalline.

The authors also made several solubility measurements with amorphous $Zn(OH)_2$ (formed by adding NaOH slowly to a solution of $Zn(NO_3)_2$ and avoiding an excess of NaOH). However, during these determinations the solid phase changed. The authors refer to this as ageing and consider the process to be, among other things, a loss of water. This ageing is affected by various experimental conditions and decreases the solubility of the solid material.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally with agitation. Zinc content was determined by potentiometric titration with $K_4Fe(CN)_6$. Total alkali content was determined by titration with HCl.

SOURCE AND PURITY OF MATERIALS:

The NaOH was carbonate-free. Crystalline $Zn(OH)_2$ was prepared by adding an excess of amorphous $Zn(OH)_2$ to 15 mol NaOH dm^{-3}, shaking the mixture, filtering it, and diluting the filtrate with water. The diluted solution then gave a precipitate of crystalline $Zn(OH)_2$. The water was boiled before being used.

ESTIMATED ERROR:

The precision of the zinc titration was 0.6%. No other details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Fricke, R.; Humme, H.; *Z. Anorg. Allgem. Chem.* 1928, *172*, 234-42.
VARIABLES:	**PREPARED BY:**
Concentration of sodium hydroxide at 30.0°C.	T. P. Dirkse

EXPERIMENTAL VALUES: Solubility of $Zn(OH)_2$ in NaOH solutions at 30.0°C.

grams of $Zn(OH)_2$ used	ml of NaOH solution used	duration of shaking	mass % NaOH	mass % ZnO	% H_2O in solid phase	nature of solid phase
2	20	23 hrs	7.20	1.44	- - -	crystalline
2	20	8 days	7.02	1.415	- - -	"
4	20	23 hrs	13.4	5.16	- - -	"
4	20	8 days	13.2	5.15	- - -	"
5	20	2.5 hrs	17.65	9.77	- - -	"
5	20	23 hrs	17.85	9.63	- - -	"
5	20	8 days	17.75	9.85	18.22	"
6	15	2.5 hrs	20.85	14.82	- - -	"
6	15	23 hrs	21.0	14.77	- - -	"
6	15	8 days	22.05	8.66	1.1	amorphous
7	15	2.5 hrs	22.95	19.42	- - -	crystalline
7	15	23 hrs	23.0	18.82	- - -	
7	15	8 days	24.65	12.81	1.0	amorphous
8	15	2.5 hrs	24.55	24.87	- - -	crystalline
8	15	23 hrs	25.75	21.86	- - -	amorphous
8	15	8 days	28.25	13.77	1.4	"
9	15	2.5 hrs	30.2	24.68	- - -	"
9	15	23 hrs	30.95	23.17	- - -	"
9	15	8 days	31.75	21.59	2.15	"

The authors present qualitative evidence which shows that the solubility of $Zn(OH)_2$ in NaOH solutions does not depend on the amount of excess solid phase.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally. The NaOH solutions were made by dilution of a concentrated carbonate-free solution. Distilled water was used and was boiled before use. Zinc content was determined by precipitating $ZnCO_3$, heating it, and weighing as ZnO. Alkali content was determined by titrating a diluted solution with HCl. The precipitates were analyzed for H_2O content by measuring the weight loss during heating.

SOURCE AND PURITY OF MATERIALS:

Crystalline $Zn(OH)_2$ was prepared by the method described earlier (1). Presumably this involved adding the requisite amount of NH_4OH to a solution of $Zn(NO_3)_2$ or $ZnCl_2$, washing the precipitate, dissolving it in aqueous NaOH and slowly diluting the resulting solution. The $Zn(OH)_2$ that then precipitates is granular.

ESTIMATED ERROR:

No details are given as to the reproducibility of the solubility values.

REFERENCES:

1. Fricke, R.; Ahrndts, T. *Z. Anorg. Allgem. Chem.* 1924, *134*, 344.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Zinc chloride; $ZnCl_2$; [7646-85-7] (3) Water; H_2O; [7732-18-5]	Holland, H. C. *J. Chem. Soc.* 1930, 643-8.
VARIABLES:	**PREPARED BY:**
Concentration of $ZnCl_2$ and temperature.	T. P. Dirkse

EXPERIMENTAL VALUES: Solubility of ZnO in $ZnCl_2$ solutions[a].

x	y	solid phase[b]	x	y	solid phase[b]
		temp., 25°C			
0.001	0.001	E	0.155	0.165	F
0.009	0.009	"	0.162	0.169	"
0.033	0.034	"	0.165	0.173	"
0.034	0.035	"	0.163	0.172	G
0.049	0.050	"	0.172	0.177	"
0.075	0.078	"	0.184	0.193	"
0.094	0.097	"	0.191	0.196	"
0.113	0.119	"	0.195	0.198	"
0.134	0.142	"	0.202	0.209	"
0.146	0.155	E + F	0.245	0.252	"
0.151	0.163	F	0.264	0.269	"
		temp., 50°C.			
0.009	0.009	E	0.159	0.167	G
0.091	0.095	"	0.160	0.168	"
0.143	0.153	"	0.165	0.171	"
0.144	0.153	F	0.200	0.205	"
0.154	0.161	"			

[a] The values are mass% values based on the equation $1/2H_2O + 1/2ZnCl_2 = HCl + 1/2ZnO$ where $x = (b + c)/(a + b + c + d)$ and $y = (b + d)/(a + b + c + d)$.

[b] E = $ZnCl_2 \cdot 5ZnO \cdot 8H_2O$; F = $ZnCl_2 \cdot ZnO \cdot 2H_2O$; G = $ZnCl_2 \cdot ZnO \cdot H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally by mixing ZnO, $ZnCl_2$ (or HCl) and H_2O and shaking the mixture for several days in a thermostat. Chloride was determined by the Volhard method. Zinc was determined by titration with $K_4Fe(CN)_6$. The composition of the solid phase was determined by the Schreinemakers' wet-residue method.

SOURCE AND PURITY OF MATERIALS:

All reagents were of a high standard of purity.

ESTIMATED ERROR:

The temperature was controlled to within 0.1°C at 25°C and to within 0.05°C at 50°C. All apparatus was standardized. No other details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Huttig, G. F.; Steiner, B. *Z. Anorg. Allg. Chem.* 1931, *199*, 149-64.
VARIABLES: Physical characteristics of zinc oxide.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Table I. Effect of the thermal history on the solubility of ZnO in 0.2822 mol KOH/dm^{-3} at 20°C.

T/°C.[a]	mol ZnO[b]	$C_{ZnO}/10^{-3}$ mol dm^{-3} 10 min.	20 min.	30 min.	90 min.
300	0.005	2.31	2.35	2.40	2.49
300	0.01	2.37	2.49	2.51	2.55
300	0.02	2.64	2.64	2.62	2.58
400	0.005	1.29	1.51	1.63	1.78
400	0.01	1.38	1.54	1.66	1.81
400	0.02	1.56	1.58	1.64	1.76
500	0.005	1.06	1.33	1.45	1.51
500	0.01	1.05	1.30	1.43	1.55
500	0.02	1.08	1.29	1.42	1.56
800	0.01	0.83	1.27	1.34	1.45
1000	0.005	0.80	1.09	1.29	1.47
1000	0.01	0.79	1.13	1.30	1.49
1000	0.02	0.78	1.16	1.34	1.46

[a] The ZnO was prepared by heating $ZnCO_3$ to the temperatures indicated in this column.

[b] Amount of solid ZnO used in the solubility determinations.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A weighed amount of ZnO was placed in a beaker, thermostatted at 20°C, and then 0.5 dm^3 of 0.2822 mol KOH dm^{-3} was added while the mixture was stirred at a constant rate of 650 rpm. Samples were removed after 10, 20, 30 and 90 minutes, filtered, and analyzed for zinc content. The analysis was done gravimetrically by weighing zinc as ZnP_2O_7. Provisions were made for excluding CO_2 during the experimental work.	The KOH was carbonate-free. No other details are given.
	ESTIMATED ERROR: No details are given about the reproducibility of any of the procedures.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH, [1310-58-3] (3) Water; H_2O; [7732-18-5]	Huttig, G. F.; Steiner, B. *Z. Anorg. Allg. Chem.* 1931, *199*, 149-64.

EXPERIMENTAL VALUES: contd.

Table II. Effect of previous history on the solubility of ZnO in 0.2822 mol KOH/dm^{-3} at 20°C.

T/°C[a]	mol ZnO[b]	$C_{ZnO}/10^{-3}$mol dm^{-3} 10 min.	20 min.	30 min.	90 min.
400	0.005	1.47	1.88	2.08	2.15
400	0.01	1.56	1.98	2.18	2.21
400	0.02	1.93	2.30	2.30	2.37
1000	0.005	0.82	1.12	1.29	1.51
1000	0.01	0.82	1.16	1.31	1.43
1000	0.02	0.86	1.11	1.34	1.47

[a] The ZnO was prepared by heating zinc oxalate to the temperatures shown in this column.

[b] Amount of solid ZnO used in the solubility determinations.

Table III. Effect of particle size on the solubility of ZnO in 0.2822 mol KOH dm^{-3} at 20°C.

T/°C[a]	particle size of ZnO	$C_{ZnO}/10^{-3}$mol dm^{-3} 10 min.	20 min.	30 min.	90 min.
300	240-100μ	2.21	2.40	2.48	2.56
300	70-50μ	2.35	2.45	2.53	2.57
300	<50μ	2.40	2.46	2.50	2.58
1000	240-100μ	0.63	0.98	1.16	1.38
1000	70-50μ	0.80	1.14	1.34	1.48
1000	<50μ	0.83	1.11	1.29	1.53

[a] The ZnO was prepared by heating $ZnCO_3$ to the temperatures given in this column.

The authors state that the solubility value determined after 90 min is the equilibrium value. They state that the concentration does not change with longer times.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Scholder, R.; Hendrich, G. Z. *Anorg. Allgem. Chem.* 1939, *241*, 76-92.
VARIABLES: Concentration of NaOH at 20°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in NaOH solutions at 20°C.

mol NaOH dm^{-3}	mol ZnO dm^{-3}	Solid phase	Duration of shaking in days
1.34	0.047	ZnO	24
2.84	0.212	"	29
6.10	0.834	"	29
9.49	1.734	"	29
12.72	2.744	"	24
14.42	2.535	$NaZn(OH)_3$	24
17.45	1.795	"	24

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally. Alkali content was determined by dissolving the sample in H_2SO_4 and back-titrating with NaOH. The zinc content was determined gravimetrically as pyrophosphate.

SOURCE AND PURITY OF MATERIALS:

Pure, carbonate-free NaOH was used. The ZnO was formed by saturating boiling NaOH solution with ZnO, cooling, filtering, and adding crystalline $Zn(OH)_2$ to the filtrate. After 12 days the $Zn(OH)_2$ had been transformed to ZnO and this was filtered off and dried over H_2SO_4.

ESTIMATED ERROR:

No details are given except that the temperature was controlled to within 0.1°C.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Scholder, R.; Hendrich, G. Z. *Anorg. Allgem. Chem.* 1939, *241*, 76-92.
VARIABLES: Concentration of sodium hydroxide and temperature.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES: Solubility of $Zn(OH)_2$ in NaOH solutions at 20°C.

mol NaOH dm^{-3}	mol ZnO dm^{-3}	Solid phase[a]	duration of shaking in days
1.32	0.079	A	69
2.76	0.344	"	69
4.15	0.407	B	161
5.81	0.735	"	192
7.29	1.095	"	190
8.76	1.555	"	154
8.78	3.443	A + B	1.7
9.45	1.088	B	185
9.80	1.822	"	185
10.11	1.940	"	185
10.67	2.680	C	57
11.04	2.751	B + C	73
12.24	3.240	B	126
12.80	3.606	B + C	126
13.34	3.071	D	44
14.25	2.576	"	57
15.76	2.115	"	82
16.52	1.944	"	204
17.18	1.863	"	19
17.82	1.778	"	46
18.77	1.716	"	38
19.58	1.685	"	38
20.00	1.475	E	42
20.14	1.425	E + F	32

[a] A = $Zn(OH)_2$; B = ZnO; C = $NaZn(OH)_3 \cdot 3H_2O$; D = $NaZn(OH)_3$; E = $Na_2Zn(OH)_4$; F = $NaOH \cdot H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally. Samples were added to H_2SO_4 and back-titrated with NaOH to determine alkali content. Zinc content was determined gravimetrically as the pyrophosphate. The same methods were used to analyze the solution and the solid phases.	The NaOH was carbonate-free. Crystalline $Zn(OH)_2$ was prepared by dissolving ZnO in a hot NaOH solution, cooling this, diluting it tenfold with water and allowing it to stand 2 to 3 weeks. During this time the crystalline $Zn(OH)_2$ precipitated from the solution.
	ESTIMATED ERROR: The temperature was controlled to within 0.1°C., but no other details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Scholder, R.; Hendrich, G. Z. *Anorg. Allgem. Chem.* 1939, *241*, 76-92.

EXPERIMENTAL RESULTS, contd. -----

Solubility of $Zn(OH)_2$ in NaOH solutions.

mol NaOH dm^{-3}	mol ZnO dm^{-3}	Solid phase[a]	Duration of shaking in days
	temp., 40°C		
1.32	0.09	A + B	79
2.93	0.45	"	79
4.17	0.41	B	79
9.30	1.81	"	79
12.67	3.03	"	79
13.24	3.78	D	27
16.48	2.61	"	38
17.59	2.41	"	38
20.52	1.84	D + E	38
21.94	1.33	E + F	10
	temp., 100°C.		
1.48	0.04	B	14
4.64	0.42	"	8
8.05	1.19	"	7
11.15	2.16	"	6
15.98	3.91	"	6
17.84	4.79	"	4
18.67	5.16	"	4
18.75	5.49	B + D	5
20.84	5.35	D	11

[a] A = $Zn(OH)_2$; B = ZnO; D = $NaZn(OH)_3$; E = $Na_2Zn(OH)_4$; F = $NaOH \cdot H_2O$

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sulfur trioxide; SO_3; [7446-11-9] (3) Water; H_2O; [7732-18-5]	Copeland, L. C.; Short, O. A. *J. Am. Chem. Soc.* 1940, *62*, 3285-91.
VARIABLES:	**PREPARED BY:**
Concentration of SO_3 at 25.0°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Equilibrium concentrations in the $ZnO-SO_3-H_2O$ system at 25°C.

mass % SO_3	mol SO_3/kg H_2O[a]	mass% ZnO	mol ZnO/kg H_2O[a]	Solid phase[b]
1.9	0.25	1.8	0.23	A
4.4	0.60	4.4	0.59	"
8.0	1.19	8.1	1.19	"
10.7	1.70	10.7	1.67	"
13.6	2.33	13.6	2.30	"
14.5	2.55	14.5	2.51	"
17.6	3.39	17.6	3.34	"
18.3	3.61	18.3	3.55	A + B

[a] Calculated by the compiler.

[b] A = $3Zn(OH)_2 \cdot ZnSO_4 \cdot 4H_2O$; B = $ZnSO_4 \cdot 7H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Mixtures of ZnO and $ZnSO_4$ solutions were boiled, filtered to remove undissolved ZnO, and cooled to 25°C. The filtrate was allowed to set for about 4 weeks with occasional shaking. Zinc content was determined by titration with $K_4Fe(CN)_6$. SO_3 content was determined gravimetrically by precipitation as $BaSO_4$.

SOURCE AND PURITY OF MATERIALS:

U. S. P. grade materials were used.

ESTIMATED ERROR:

The authors state that duplicate mixtures agreed to within 2 to 3%.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Iofa, Z. A.; Mirlina, S. Ya.; Moisiejeva, N. B. *Zhur. Prikład Khim.* 1949, *22*, 983-94.
VARIABLES: Temperature and KOH concentration.	PREPARED BY: T. Michalowski

EXPERIMENTAL VALUES:

The data are presented almost exclusively in graphical form. The maximum solubility at 0°C is 2.81 mol kg^{-1} of ZnO in 8.1 mol kg^{-1} of KOH. Up to this KOH concentration the solubility of ZnO increases with increasing KOH concentration and ZnO is the equilibrium solid phase. At a KOH concentration of 8.1 mol kg^{-1} the zinc begins to precipitate as a zincate and the solubility of ZnO in aqueous KOH then decreases rapidly with increasing KOH concentration.

At 30°C the solubility of ZnO also increases with increasing KOH concentration, but more rapidly than at 0°, so that in a KOH concentration of 7 mol kg^{-1} the ZnO solubility at 30°C is almost double that at 0°C.

The authors also describe the various forms of $Zn(OH)_2$--α,β,γ, and ε. The solubility decreases with increasing stability, with ε-$Zn(OH)_2$ being the most stable form.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was attained isothermally at 0, 15 and 30°C in a thermostat.	No information is given.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Zinc sulfate; $ZnSO_4$; [7733-02-0] (3) Water; H_2O; [7732-18-5]	Akselrud, N. V.; Fialkov, Ya. A. *Ukrain. Khim. Zhur.* 1950, *16*, 283-95.
VARIABLES: Concentration of $ZnSO_4$ at 18.0°C.	PREPARED BY: T. Michalowski

EXPERIMENTAL VALUES:

Composition of equilibrium solutions at 18.0°C.

mol Zn(II) dm^{-3}	pH	-log K_s^o
0	----	16.705[a]
0.0154	6.71	16.6620
0.0482	6.51	16.5528
0.0823	6.43	16.4862
0.1520	6.31	16.4601
0.4580	6.04	16.5120
0.9275	5.82	16.6489
1.0257	5.78	16.6797
1.5273	5.60	16.8688
2.2340	5.38	17.1334

[a]This value was determined by extrapolation of the [Zn(II)] vs -log K_s^o curve for the three most dilute solutions to [Zn(II)] = 0.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
ZnO was added to solutions of $ZnSO_4$ and the mixture was shaken in a thermostat at 18.0°C until equilibrium was reached. The pH of the solution was measured potentiometrically and the Zn content was determined polarographically or by titration with $K_4Fe(CN)_6$.	Reagent grade materials were used. The $ZnSO_4$ was recrystallized twice from water.
	ESTIMATED ERROR: Not enough information is given to estimate this.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Arkhipov, M. I.; Pakshver, A. B.; Podbornova, N. I. *Zhur. Priklad. Khim.* 1950, *23*, 650-6; *J. Applied Chem. USSR (Engl. transl.)* 1950, *23*, 685-91.
VARIABLES: Concentration of NaOH at 20°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in NaOH solutions at 20°C.

g NaOH dm^{-3}	mol NaOH dm^{-3} [a]	g Zn dm^{-3}	mol $Zn(OH)_2 dm^{-3}$ [a]
68.4	1.71	8.0	0.12
132.0	3.30	24.7	0.38
202.0	5.05	45.5	0.70
360.0	9.00	80.4	1.23

[a] Calculated by compiler.

The following results were obtained by diluting saturated solutions of $Zn(OH)_2$ in aqueous NaOH with water until a precipitate began to settle out.

mol NaOH dm^{-3}	mol $Zn(OH)_2$ dm^{-3}
0.180	0.0052
0.355	0.0104
0.610	0.0217
1.120	0.0464

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The $Zn(OH)_2$ was introduced into an amount of solvent 14 times its weight. The mixture was allowed to stand 24 hours at 20°C. After filtration, the filtrate was analyzed for Zn content by determination with molybdenum blue (1). In another experiment, saturated solutions of $Zn(OH)_2$ in aqueous NaOH were diluted with water until a precipitate began to form. The mixture was then allowed to stand in the dark for 2 days at 20°C. It was then filtered and the filtrate was analyzed for zinc and NaOH content. The method for NaOH analysis is not described.	The $Zn(OH)_2$ was prepared by a procedure described earlier (2). No information is given about the source of any other materials.
	ESTIMATED ERROR: No details are given.
	REFERENCES: 1. Razumeev, A. *Synthetic Fiber Handbook*, State Chem. Press, 1937. 2. Pakshver, A.; Arkhipov, M.; Geller, B. *J. Applied Chem. USSR* 1950, 23, 2.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Ammonia; NH_3; [7664-41-7] (3) Water; H_2O; [7732-18-5]	Arkhipov, M. I.; Pakshver, A. B.; Podbornova, N. I. *Zhur. Prikład. Khim.* 1950, *23*, 650-6; *J. Applied Chem. USSR (Engl. transl.)* 1950, *23*, 685-91.
VARIABLES: Concentration of NH_3 at 20°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in aqueous NH_3 solutions at 20°C.

g NH_3 dm^{-3}	mol NH_3 dm^{-3} [a]	g Zn dm^{-3}	mol $Zn(OH)_2$ dm^{-3} [a]
46.7	2.74	10.6	0.16
82.3	4.83	16.2	0.25
130.5	7.66	19.3	0.30
139.0	8.16	19.3	0.30
188.5	11.07	18.2	0.28
213.0	12.51	18.7	0.29

[a] Calculated by the compiler.

The following results were obtained by diluting saturated solutions of $Zn(OH)_2$ in aqueous NH_3 with water until a precipitate began to settle out.

mol NH_3 dm^{-3}	mol $Zn(OH)_2$ dm^{-3}
0.256	0.0124
0.186	0.0070
0.156	0.0040
0.100	0.0023

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:
The $Zn(OH)_2$ was introduced into an amount of solvent 14 times its weight. The mixture was allowed to stand 24 hours at 20°C. After filtration, the filtrate was analyzed for Zn content by determination with molybdenum blue (1). In another experiment, saturated solutions of $Zn(OH)_2$ in aqueous NH_3 were diluted with water until a precipitate began to form. The mixture was then filtered and the filtrate was analyzed for Zn and NH_3 content. The method of analysis for NH_3 is not described.

SOURCE AND PURITY OF MATERIALS:
The $Zn(OH)_2$ was prepared by a procedure described earlier (2). No information is given about the source or purity of any other materials.

ESTIMATED ERROR:
No details are given.

REFERENCES:
1. Razumeev, A. *Synthetic Fiber Handbook*, State Chem. Press, 1937.
2. Pakshver, A.; Arkhipov, M.; Geller, B. *J. Applied Chem. USSR* 1950, *23*, 2.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1951, *20A*, 28-38.
VARIABLES:	**PREPARED BY:**
Concentration of NaOH and temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of ZnO in aqueous NaOH.

mass% ZnO	mol ZnO/kg H_2O[a]	mass% Na_2O	mol NaOH/kg H_2O[a]
		temp., 35°C.	
0.192	0.024	3.03	1.04
0.4815	0.063	4.850	1.71
1.413	0.199	10.75	4.12
3.512	0.519	12.82	5.14
4.980	0.765	15.08	6.28
5.920	0.931	15.87	6.76
8.426	1.40	17.88	8.09
9.841	1.73	20.08	9.55
		temp., 45°C.	
0.202	0.025	2.28	0.779
0.555	0.072	4.505	1.58
2.365	0.344	13.240	5.23
4.627	0.737	18.20	7.86
6.68	1.12	20.04	9.12
8.143	1.42	21.30	10.06
10.07	1.82	22.05	10.83
12.041	2.28	23.14	11.90

[a] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally by adding ZnO to the NaOH solutions and mechanically shaking the mixtures for 3 hours in a thermostat. Zinc content was determined by titration with $K_4Fe(CN)_6$. Alkali content was determined by dissolving the sample in excess H_2SO_4 and back-titrating with NH_4OH.

SOURCE AND PURITY OF MATERIALS:

Reagent grade materials were used.

ESTIMATED ERROR:

No details are given except that the temperature was controlled to within 0.1°C.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1951, *20A*, 28-38.

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of ZnO in aqueous NaOH.

mass% ZnO	mol ZnO/kg H_2O[a]	mass% Na_2O	mol NaOH/kg H_2O[a]
	temp., 55°C.		
0.227	0.029	3.46	1.20
0.755	0.099	5.57	1.98
2.561	0.362	10.12	3.89
5.050	0.784	15.34	6.42
7.889	1.30	17.31	7.71
9.530	1.64	19.07	8.90
11.95	2.21	21.50	10.77
14.021	2.68	21.80	11.30
	temp., 65°C.		
0.1829	0.023	3.022	1.04
0.531	0.070	6.39	2.29
2.009	0.283	10.80	4.13
4.730	0.729	15.52	6.49
8.601	1.43	17.54	7.92
10.580	1.86	19.58	9.35
12.862	2.37	20.50	10.25
16.031	3.14	21.32	11.34
	temp., 75°C.		
0.1820	0.023	3.98	1.38
0.456	0.060	6.89	2.48
1.600	0.235	14.90	5.95
4.221	0.663	17.55	7.48
8.810	1.55	21.538	10.31
11.348	2.16	24.123	12.46
14.299	2.89	25.089	13.80
18.038	3.93	25.556	15.10

[a] Calculated by the compiler.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1951, *20A*, 28-38.
VARIABLES: Method of preparation of $Zn(OH)_2$, concentration of NaOH, and temperature.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of crystalline $Zn(OH)_2$ (prep. "a") in aqueous NaOH.

mass% ZnO	mol ZnO/kg H_2O[a]	mass% Na_2O	mol NaOH/kg H_2O[a]
	temp. 35°C		
0.410	0.052	3.00	1.00
1.521	0.199	4.501	1.55
3.390	0.478	9.410	3.48
5.512	0.745	13.55	5.40
9.123	1.51	16.540	7.18
11.510	1.98	17.22	7.79
14.341	2.74	21.462	10.79
16.815	3.44	23.120	12.42
	temp. 45°C		
0.5620	0.071	2.74	0.914
1.780	0.233	4.390	1.51
5.002	0.748	12.801	5.02
7.988	1.30	16.23	6.95
12.33	2.18	18.04	8.36
15.510	2.91	19.120	9.44
18.39	3.64	19.64	10.22
22.110	4.88	22.215	12.87

[a]Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was reached isothermally by adding $Zn(OH)_2$ to the NaOH solutions and mechanically shaking the mixtures for 3 hours in a thermostat. Zinc content was determined by titration with $K_4Fe(CN)_6$. Alkali content was determined by dissolving the sample in excess H_2SO_4 and back-titrating with NH_4OH.	Reagent grade materials were used. $Zn(OH)_2$ was prepared two ways: (a) adding the calculated amount of NH_4OH to aqueous $ZnSO_4$, filtering, washing the precipitate, redissolving it in excess NH_4OH, and allowing the NH_3 to evaporate; (b) dissolving ZnO in aqueous NaOH with heating, cooling, filtering, and diluting the filtrate with water.
	ESTIMATED ERROR: No indication is given of the precision of any of the procedures except that the temperature was controlled to within 0.1°C.
	REFERENCES:

COMPONENTS	ORIGINAL MEASUREMENTS
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1951, *20A*, 28-38.

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of crystalline $Zn(OH)_2$ (prep. "a") in aqueous NaOH.

mass% ZnO	mol ZnO/kg H_2O[a]	mass% Na_2O	mol NaOH/kg H_2O[a]
	temp. 55°C		
0.709	0.091	3.64	1.23
1.94	0.125	5.34	1.86
5.825	0.360	10.930	4.24
8.77	1.40	14.03	5.86
13.44	2.32	15.30	6.93
16.92	3.14	16.89	8.23
19.83	3.94	18.34	9.57
23.00	4.95	19.90	11.24
	temp. 65°C		
0.545	0.069	2.817	0.940
1.423	0.190	6.44	2.25
4.903	0.724	11.90	4.61
8.580	1.37	14.54	6.09
13.385	2.29	14.68	6.58
16.958	3.20	18.03	8.95
20.21	4.07	18.80	9.94
23.61	5.11	19.65	11.17
	temp. 75°C		
0.445	0.057	2.90	0.968
1.298	0.174	7.10	2.50
3.939	0.599	15.29	6.11
7.804	1.29	17.70	7.66
14.134	2.58	18.63	8.94
17.018	3.34	20.30	10.45
21.256	4.53	21.056	11.77
24.38	5.58	21.90	13.15

[a]Calculated by the compiler

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1951, *20A*, 28-38.
(2) Sodium hydroxide; NaOH [1310-73-2]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of $Zn(OH)_2$ (prep. "b") in aqueous NaOH.

mass% ZnO	mol ZnO/kg H_2O[a]	mass% Na_2O	mol NaOH/kg H_2O[a]
	temp., 35°C.		
0.398	0.052	5.132	1.75
1.002	0.134	7.090	2.49
2.960	0.417	9.838	3.64
4.836	0.717	12.34	4.81
7.693	1.24	11.110[b]	4.70
9.950	1.71	18.62	8.41
12.516	2.33	21.38	10.43
14.010	2.74	23.080	11.83
	temp., 45°C.		
0.5204	0.066	2.738	0.913
1.380	0.179	4.44	1.51
4.101	0.582	12.28	4.57
6.592	1.05	16.63	6.99
10.111	1.73	18.241	8.21
13.860	2.58	20.03	9.77
15.941	3.08	20.56	10.44
20.292	4.52	24.57	14.37
	temp., 55°C.		
0.603	0.077	3.35	1.13
1.510	0.199	5.46	1.89
4.391	0.640	11.38	4.36
7.45	1.18	14.95	6.21
11.423	1.92	15.59	6.89
15.235	2.80	18.02	8.71
18.490	3.60	18.50	9.47
21.950	4.61	19.591	10.81
	temp., 65°C.		
0.5310	0.068	2.93	0.979
0.9481	0.125	6.164	2.14
4.112	0.613	13.500	5.29
2.102[c]	0.340	17.00	7.23
12.530	2.22	18.136	8.44
16.660	3.21	19.60	9.92
19.511	4.03	20.99	11.38
22.800	4.69	21.43	11.57
	temp., 75°C.		
0.355	0.045	3.156	1.06
0.832	0.110	6.513	2.27
3.154	0.483	16.60	6.67
6.555	1.26	19.30	9.71
13.186	2.47	21.20	10.43
16.710	3.38	22.50	11.94
20.310	4.41	23.05	13.13
23.341	5.44	23.92	14.63

[a] Calculated by the compiler.

[b] This appears to be an error. From the context of the Table this value should be 16.110 giving a value of 6.82 mol NaOH/kg H_2O.

[c] This value appears to be an error. Presumably it should be 7.102 which gives a value of 1.15 mol ZnO/kg H_2O.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1952, *21A*, 14-21.
VARIABLES:	PREPARED BY:
Concentration of KOH and temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous KOH.

mass% ZnO	C_{ZnO}/mol kg^{-1} [a]	mass% K_2O	C_{KOH}/mol kg^{-1} [a]
	temp., 35°C.		
0.180	0.0234	5.314	1.19
0.512	0.0719	12.015	2.92
1.598	0.241	16.850	4.39
2.044	0.326	20.910	5.76
4.179	0.704	22.90	6.67
5.590	0.992	25.200	7.73
7.029	1.32	27.310	8.83
8.031	1.57	29.000	9.78
	temp., 45°C.		
0.206	0.0266	4.700	1.05
0.691	0.0912	6.220	1.42
2.049	0.316	18.360	4.90
3.501	0.586	23.070	6.67
5.521	0.992	26.130	8.12
7.390	1.42	28.530	9.45
9.25	1.90	31.060	11.05
10.844	2.33	31.940	11.85

[a] Data converted to mol/kg H_2O by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally by shaking the mixtures for 3 hours in a thermostat. Zinc content was determined by titration with $K_4Fe(CN)_6$. Alkali content was determined by dissolving the sample in excess H_2SO_4 and back-titrating with NH_4OH.	The water was freshly redistilled. The ZnO and KOH were reagent grade. Care was taken to exclude CO_2.
	ESTIMATED ERROR:
	No details are given except that the temperature was controlled to within 0.1°C.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* **1952**, *21A*, 14-21.

EXPERIMENTAL VALUES, contd.

Solubility of ZnO in aqueous KOH.

mass% ZnO	C_{ZnO}/mol kg^{-1} [a]	mass% K_2O	C_{KOH}/mol kg^{-1} [a]
	temp., 55°C.		
0.218	0.0285	5.700	1.29
0.748	0.102	9.430	2.23
2.559	0.391	17.130	4.53
4.70	0.771	20.37	5.70
6.97	1.23	23.56	7.20
8.530	1.65	27.800	9.27
9.89	1.97	28.300	9.72
12.042	2.54	29.680	10.81
	temp., 65°C.		
0.1757	0.0226	4.2730	0.949
0.5200	0.0709	9.4100	2.22
1.743	0.272	19.510	5.26
3.660	0.610	22.660	6.53
7.610	1.44	27.680	9.08
9.166	1.80	28.440	9.67
10.986	2.26	29.340	10.44
12.638	2.73	30.560	11.42
	temp., 75°C.		
0.1653	0.0213	4.3580	0.969
0.5010	0.0684	9.532	2.25
1.433	0.224	20.036	5.42
3.266	0.553	24.220	7.09
7.804	1.48	27.422	8.99
9.539	1.92	29.416	10.23
11.410	2.39	30.040	10.89
13.86	3.06	30.56	11.67

[a] Data converted to mol/kg H_2O by the compiler.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1952, *21A*, 14-21.
VARIABLES: Method of preparing $Zn(OH)_2$, concentration of KOH, and temperature.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ (prep. "a") in aqueous KOH.

mass% ZnO	C_{ZnO}/mol kg^{-1} [a]	mass% K_2O	C_{KOH}/mol kg^{-1} [a]
		temp., 35°C.	
0.3865	0.0513	7.0630	1.62
1.280	0.185	13.730	3.43
2.331	0.363	18.840	5.07
4.070	0.663	20.510	5.77
6.194	1.082	23.506	7.10
8.390	1.586	26.640	8.70
10.360	2.094	28.850	10.08
11.810	2.507	30.320	11.12
		temp., 45°C.	
0.547	0.0709	4.715	1.06
1.502	0.202	7.046	1.64
4.667	0.750	18.850	5.23
6.524	1.130	22.570	6.76
10.50	2.064	26.990	9.17
12.954	2.819	30.600	11.51
15.84	3.755	32.34	13.25
18.123	4.561	33.060	14.38

[a] Data converted to mol/kg H_2O by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally by shaking the mixtures for 3 hours in a thermostat. Zinc content was determined by titration with $K_4Fe(CN)_6$. Alkali content was determined by dissolving the sample in excess H_2SO_4 and back-titrating with NH_4OH.	The water was freshly redistilled. All other materials were of reagent grade quality. The $Zn(OH)_2$ was prepared in 2 ways; (a) by adding the calculated amount of NH_4OH to aqueous $ZnSO_4$, filtering, washing the precipitate and redissolving it in excess NH_4OH, then allowing the NH_3 to evaporate; (b) dissolving ZnO in aqueous NaOH with heating, cooling, filtering, and diluting the filtrate with H_2O.
	ESTIMATED ERROR: No details are given except that the temperature was controlled to within 0.1°C.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1952, *21A*, 14-21.

EXPERIMENTAL VALUES, contd.

Solubility of $Zn(OH)_2$ (prep. "a") in aqueous KOH.

mass% ZnO	C_{ZnO}/mol kg^{-1} [a]	mass% K_2O	C_{KOH}/mol kg^{-1} [a]
		temp., 55°C.	
0.679	0.0891	5.700	1.29
1.755	0.242	9.090	2.16
4.88	0.758	16.03	4.30
7.509	1.251	18.780	5.41
11.138	2.054	22.230	7.08
13.980	2.796	24.590	8.50
16.815	3.653	26.640	10.00
19.500	4.650	28.980	11.94
		temp., 65°C.	
0.466	0.0600	4.050	0.90
1.028	0.141	9.230	2.18
3.980	0.618	16.890	4.53
6.923	1.210	22.800	6.89
11.301	2.200	25.590	8.61
14.331	3.056	28.050	10.34
17.66	4.030	28.50	11.24
20.39	4.986	29.37	12.41
		temp., 75°C.	
0.423	0.0548	4.800	1.08
1.003	0.138	9.457	2.24
2.992	0.453	15.930	4.17
6.730	1.123	19.670	5.67
11.634	2.318	26.720	9.20
14.480	3.070	27.570	10.10
18.512	4.277	28.320	11.31
21.248	5.261	29.131	12.46

[a] Data converted to mol/kg H_2O by the compiler.

COMPONENTS:	ORIGINAL MAESUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium hydroxide, KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Deshpande, V. V.; Kabadi, M. B. *J. Univ. Bombay* 1952, *21A*, 14-21.

EXPERIMENTAL VALUES, contd.

Solubility of $Zn(OH)_2$ (prep. "b") in aqueous KOH.

mass% ZnO	C_{ZnO}/mol kg^{-1} [a]	mass% K_2O	C_{KOH}/mol kg^{-1} [a]
		temp., 35°C.	
0.326	0.0432	6.890	1.58
1.030	0.147	13.152	3.25
2.023	0.312	18.400	4.91
3.590	0.581	20.473	5.72
4.700	0.800	23.156	6.81
6.340	1.140	25.32	7.87
7.911	1.517	28.010	9.28
9.522	1.913	29.315	10.18
		temp., 45°C.	
0.5003	0.0647	4.460	1.00
1.270	0.170	7.145	1.66
3.624	0.569	18.070	4.90
4.994	0.843	22.190	6.47
7.915	1.473	26.090	8.39
9.832	1.960	28.540	9.83
12.710 [b]	2.766	30.840	11.60
41.891 [b]	9.69	32.000	12.79
		temp., 55°C.	
0.600	0.0790	6.140	1.40
1.476	0.204	9.460	2.26
4.290	0.661	15.950	4.25
6.831	1.167	21.250	6.27
9.533	1.780	24.690	7.97
11.803	2.346	26.380	9.06
13.934	2.978	28.590	10.56
17.99	4.245	29.95	12.21
		temp., 65°C.	
0.461	0.0586	2.929	0.64
0.777	0.106	9.116	2.15
3.39	0.533	18.41	5.00
5.990	1.044	23.550	7.10
9.662	1.887	27.430	9.26
12.012	2.483	28.560	10.20
13.991	3.058	29.810	11.26
18.733	4.540	30.580	12.81
		temp., 75°C.	
0.4061	0.0528	5.031	1.13
0.611	0.0833	9.234	2.17
2.532	0.386	16.890	4.45
5.616	0.962	22.670	6.71
9.780	1.917	27.531	9.32
12.430	2.607	29.000	10.51
15.132	3.361	29.560	11.35
19.019	4.604	30.230	12.65

[a] Data converted to mol/kg H_2O by the compiler.

[b] This appears to be a misprint. It possibly should be 14.891, giving a value of 3.444 mol ZnO/kg H_2O.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Sochevanov, V. G. *Zhur, Obshchei Khim.* 1952, *22*, 1073-85; *J. Gen. Chem. USSR (Engl. transl.)* 1952, *22*, 1119-1128.
VARIABLES:	PREPARED BY:
Concentration of potassium hydroxide.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of ZnO in aqueous KOH at 18-22°C.

K_2O, mol%	ZnO mol%	sp. gr.	mol KOH/kg H_2O[a]	mol ZnO/kg H_2O[a]	KOH, mol dm^{-3}[a]	ZnO, mol dm^{-3}[a]
2.05	0.182	1.119	2.32	0.10	2.33	0.10
3.98	0.59	1.224	4.63	0.34	4.55	0.34
5.15	1.01	1.292	6.10	0.60	5.90	0.58
8.73	2.09	1.472	10.88	1.30	9.89	1.18
9.97	2.60	- - -	12.67	1.65	- - -	- - -
11.43	3.20	1.589	14.88	2.08	12.60	1.76
12.11	3.79	1.653	15.85	2.50	13.51	2.11
1.0	0.0		1.12	- - -		
2.0	0.20		2.27	0.11		
3.0	0.42		3.45	0.24		
4.0	0.65		4.66	0.38		
5.0	0.90		5.90	0.53		
6.0	1.18		7.18	0.71		
7.0	1.50		8.50	0.91		
8.0	1.84		9.86	1.13		
9.0	2.22		11.26	1.39		
10.0	2.64		12.72	1.68		
11.0	3.18		14.24	2.06		
12.0	3.72		15.82	2.45		
13.0	4.30		17.47	2.89		

[a] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was approached isothermally. Mixtures were kept at 18-24°C for more than 60 days with occasional shaking. Zinc content was determined by a volumetric acidometric method (1). Alkali content was determined by dissolving the sample in H_2SO_4 and back-titrating with aqueous KOH.

SOURCE AND PURITY OF MATERIALS:

All materials were of reagent grade quality.

ESTIMATED ERROR:

No details are given.

REFERENCES:

1. Hahn, F. L.; Hartlieb, E. *Z. Anal. Chem.* 1927, *71*, 225.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Sochevanov, V. G. *Zhur. Obshchei Khim*, 1952, *22*, 1073-85; *J. Gen. Chem. USSR (Engl. transl.)* 1952, *22*, 1119-28.
VARIABLES:	PREPARED BY:
Concentration of potassium hydroxide.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of $Zn(OH)_2$ in aqueous KOH at 18-22°C.

K_2O, mol%	mol KOH/kg H_2O[a]	ZnO, mol%	mol ZnO/kg H_2O[a]	sp. gr.	$KOH_{1\,3}$[a] mol dm^{-3}	$ZnO_{1\,3}$[a] mol dm^{-3}
2.14	2.43	0.37	0.21	1.132	2.43	0.21
4.28	5.05	1.53	0.90	1.276	4.91	0.88
5.27	6.34	2.36	1.42	1.351	6.06	1.36
7.44	9.31	3.79	2.37	1.490	8.50	2.17
1.0	1.12	0.0	- - -			
2.0	2.28	0.34	0.19			
3.0	3.47	0.83	0.48			
4.0	4.70	1.44	0.85			
5.0	5.98	2.12	1.27			
6.0	7.31	2.82	1.72			
7.0	8.70	3.56	2.21			
8.0	10.15	4.44	2.82			

[a] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally by keeping the mixtures at 18-24°C for more than 60 days. The mixtures were shaken occasionally. Alkali content was determined by adding an excess of H_2SO_4 and back-titrating with aqueous KOH.[4] Zinc content was determined by a volumetric acidometric method (1).	Reagent grade materials were used. The $Zn(OH)_2$ was prepared by saturating hot aqueous KOH with ZnO, filtering, and diluting the filtrate with 15-20 times its volume of water. This solution precipitated crystalline $Zn(OH)_2$ over a period of 2 weeks.
	ESTIMATED ERROR: No details are given but the deviation in duplicate results are less than 1%.
	REFERENCES: 1. Hahn, F. L.; Hartlieb, E. Z. *Anal. Chem.* 1927, *71*, 225.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Dirkse, T. P.; Postmus, C.; Vandenbosch, R. *J. Am. Chem. Soc.* 1954, *76*, 6022-4.
VARIABLES: Concentration of NaOH at 25.0°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous NaOH at 25.0°C.[a]

Concn. of NaOH		
mol dm^{-3}	mol kg^{-1}	$10^4 C_{ZnO}$/mol dm^{-3}
0.578	0.581	87.5
0.520	0.521	75.4
0.462	0.462	55.7
0.405	0.404	48.6
0.347	0.345	31.1
0.289	0.287	29.7
0.231	0.229	13.4
0.173	0.171	7.5
0.116	0.114	3.8
0.058	0.057	5.9

[a] In the original article the data are presented only in graphical form. Those graphs are based on these data.

Extrapolation of the above data to infinite dilution gives a value of about 3×10^{-4} mol dm^{-3}. This is considered to the solubility of $Zn(OH)_2$ in water at this temperature.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The mixtures of solid ZnO and aqueous NaOH were kept for a month in a constant temperature bath and shaken frequently. Analysis for zinc was done amperometrically (1).	Reagent grade materials were used. Special precautions were taken to exclude CO_2.
	ESTIMATED ERROR: About 3%.
	REFERENCES: 1. Nimer, E. C.; Hamm, R. E.; Lee, G. C. *Anal. Chem.* 1950, *22*, 790.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Dirkse, T. P.; Postmus, C., Vandenbosch, R. *J. Am. Chem. Soc.* 1954, *76*, 6022-4.
VARIABLES:	**PREPARED BY:**
Concentration of KOH at 25.0°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous KOH at 25.0°C.[a]

conc. of KOH / mol dm^{-3}	conc. of KOH / mol kg^{-1}	$10^4 C_{ZnO}$ / mol dm^{-3}
0.674	0.680	89.9
0.607	0.609	73.2
0.539	0.540	59.5
0.472	0.470	45.7
0.404	0.402	32.7
0.337	0.333	23.0
0.270	0.265	15.8
0.202	0.199	8.4
0.135	0.132	3.7
0.067	0.066	1.5

[a] The data are presented only in graphical form in the article. Those graphs are based on these numerical data.

In the article the data are treated according to a method suggested earlier (2). This treatment gives thermodynamic values for the equilibrium constants of the following reactions.

$$ZnO(s) + OH^- + H_2O = Zn(OH)_3^- \qquad K = 6 \times 10^{-4}$$

$$ZnO(s) + 2OH^- + H_2O = Zn(OH)_4^{2-} \qquad K = (100 \pm 2) \times 10^{-4}$$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The mixtures of solid ZnO and aqueous KOH were kept for a month in a constant temperature bath. They were shaken rather frequently. Analysis for zinc was done amperometrically (1).	Reagent grade materials were used.
	ESTIMATED ERROR: About 3%.
	REFERENCES: 1. Nimer, E. C.; Hamm, R. E.; Lee, G. C. *Anal. Chem.* 1950, *22*, 790. 2. McDowell, L. A.; Johnston, H. L. *J. Am. Chem. Soc.* 1936, *58*, 2009.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Fulton, J. W.; Swinehart, D. F. *J. Am. Chem. Soc.* 1954, *76*, 864-7.
VARIABLES: Concentration of NaOH at 25°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility[a] of $Zn(OH)_2$ in aqueous NaOH at 25°C.

C_{NaOH}/mol kg^{-1}	$10^6 C_{ZnO}$/mol kg^{-1}	C_{NaOH}/mol kg^{-1}	$10^6 C_{ZnO}$/mol kg^{-1}
0.000413	5.83	0.0311	75.7
0.000858	6.07	0.0386	107
0.00182	5.49	0.0497	151
0.00452	9.05	0.0669	247
0.00721	13.7	0.102	509
0.00986	19.5	0.190	1610
0.0186	36.6		

[a] Each value is the average of a pair of samples, one approaching equilibrium from supersaturation and one from undersaturation.

The solubility of $Zn(OH)_2$ in water at 25°C was $1.0(\pm 0.1) \times 10^{-5}$ mol/kg H_2O.

Some solubility measurements were also made in dilute HCl solutions but no numerical values are reported. The data are reported only graphically as a pH vs concentration of zinc plot.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Mixtures were equilibrated in nitrogen-filled flasks for 10 days. Equilibrium was approached from undersaturation and from supersaturation. The mixtures were allowed to sediment for up to two weeks before samples were taken for analysis. Zinc content was determined either colorimetrically using dithizone or by titration with $K_4Fe(CN)_6$. The temperature during equilibration was controlled at 25 ± 0.05°C.	$Zn(OH)_2$ was prepared by adding NH_4OH to aqueous $ZnSO_4$, washing the precipitate with H_2O and NH_4OH over a week or two. The washed precipitate was dissolved in concentrated NH_4OH and the NH_3 was removed by air diffusion into H_2SO_4. The water used was conductivity water. All other materials were of reagent grade quality.
	ESTIMATED ERROR: Less than 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Chromium(VI) oxide; CrO_3; [1333-82-0] (3) Water; H_2O; [7732-18-5]	Hayek, E.; Hatzl, H.; Schmid, H. *Monatsh.* 1954, *85*, 92-7.
VARIABLES:	**PREPARED BY:**
Concentration of CrO_3 at 35°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous CrO_3 at 35°C.

C_{CrO_3}/mol dm^{-3}	C_{ZnO}/mol dm^{-3}	Solid phase
0.0004	0.0003	$ZnO + Zn(OH)_2$
0.0004	0.0003	- - - - - -
0.0080	0.0059	$ZnCrO_4 \cdot 2.5Zn(OH)_2$
0.0296	0.019	"
0.0563	0.035	"
0.105	0.062	"
0.117	0.069	"
0.148	0.085	"
0.181	0.103	"
0.196	0.110	"
0.271	0.148	"
0.316	0.170	$ZnCrO_4 \cdot Zn(OH)_2$
0.427	0.225	"
0.566	0.293	"
0.735	0.375	"
0.925	0.467	"
1.120	0.562	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

2.34 g of ZnO was added to 100 ml of the CrO_3-H_2O solution. The mixture was shaken vigorously for 30 min and then slowly in a thermostat at 35°C for 8 to 12 weeks. The electrical conductivity of the solution was measured to determine when equilibrium had been established. The liquid and solid phases were then separated from each other by filtration. Analysis was done iodometrically or by the method of van der Meulen (1).

SOURCE AND PURITY OF MATERIALS:

All materials were of analytical reagent grade quality. The ZnO was heated strongly before it was used.

ESTIMATED ERROR:

No information is given.

REFERENCES:

1. Meulen, J. H. van der *Chem. Weekbl.* 1940, 37, 436.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium chloride; NaCl; [7647-14-5] (3) Sodium hydroxide; NaOH; [1310-73-2] (4) Water; H_2O; [7732-18-5]	Urazov, G. G.; Lipshits, B. M.; Lovchikov, V. S. *Tsvetnyė Metal.* 1956, *29*, 37-42.
VARIABLES: Concentration of NaOH at 25° and at 75°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Table I. Solubility in the system Na_2O-H_2O-ZnO at 25.0°C.

C_{Na_2O}/mass%	C_{ZnO}/mass%	C_{H_2O}/mass%	C_{NaOH}/mol kg^{-1} [a]	C_{ZnO}/mol kg^{-1} [a]	Solid phase [b]
1.40	0.16	98.44	0.459	0.020	A
3.89	1.12	94.99	1.32	0.145	"
5.47	1.58	92.95	1.90	0.209	"
7.56	2.03	90.41	2.70	0.276	"
8.83	1.51	89.66	3.18	0.207	"
11.06	2.03	86.91	4.11	0.287	B
14.10	3.75	82.15	5.54	0.561	"
16.73	4.90	78.37	6.89	0.768	"
19.29	7.21	73.50	8.47	1.21	"
21.47	8.38	70.15	9.87	1.47	"
23.80	10.03	66.17	11.6	1.86	"
24.76	17.04	58.20	13.7	3.60	C
26.90	15.32	57.78	15.0	3.26	"
27.58	15.03	57.39	15.5	3.22	"
29.54	11.53	58.93	16.2	2.40	"

[a] The mol/kg H_2O values were calculated by the compiler.

[b] The solid phases are: A = $Zn(OH)_2$; B = ZnO; C = $Na[Zn(OH)_3]\cdot H_2O$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally in a water bath whose temperature was controlled to within 0.1°C. The mixtures of ZnO and solution were agitated in the constant temperature bath until zinc analyses of the solution reached a constant value. The method of analysis is not described. It appears that the composition of the solid phase was determined by the method of wet-residues. Solubility measurements at the boiling point were made in a steel cylinder immersed in the heating medium (either liquid paraffin or a molten lead-tin alloy). Water and NaOH were introduced into the cylinder, the mixture was brought to a boil, and the ZnO was then added with agitation.	No information is given.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium chloride; NaCl; [7647-14-5] (3) Sodium hydroxide; NaOH; [1310-73-2] (4) Water; H_2O; [7732-18-5]	Urazov, G. G.; Lipshits, B. M.; Lovchikov, V. S. *Tsvetnye Metal.* 1956, 29, 37-42.

EXPERIMENTAL RESULTS, contd:

Table II. Solubility in the system Na_2O-H_2O-ZnO at 75.0°C.

C_{Na_2O}/mass%	C_{ZnO}/mass%	C_{H_2O}/mass%	C_{NaOH}/mol kg^{-1} [a]	C_{ZnO}/mol kg^{-1} [a]	Solid phase [b]
1.34	0.15	98.51	0.439	0.019	B
1.90	0.31	97.79	0.627	0.039	"
2.63	0.68	96.69	0.877	0.086	"
3.79	1.48	94.73	1.29	0.192	"
4.88	2.55	92.57	1.70	0.338	"
6.25	3.48	90.27	2.23	0.474	"
7.77	5.06	87.17	2.88	0.713	"
9.77	6.72	83.51	3.77	0.989	"
11.59	8.56	79.85	4.68	1.32	"
12.60	9.72	77.68	5.23	1.54	"
14.34	11.44	74.22 [c]	6.23	1.89	"
15.58	12.36	72.26 [c]	6.97	2.11	"
18.17	14.74	67.09	8.74	2.70	"
20.78	17.33	61.89	10.8	3.44	"
23.53	20.05	56.42	13.5	4.37	"
23.88	20.36	55.76	13.8	4.49	"
25.07	22.84	52.09	15.5	5.39	C
27.44	20.53	52.03	17.0	4.85	"
28.98	19.73	51.29	18.2	4.73	"
29.60	19.41	50.99	18.7	4.68	"
34.38	17.64	47.98	23.1	4.52	"
35.12	16.20	48.68	23.3	4.09	D
38.61	12.32	49.07	25.4	3.08	"
39.98	11.29	48.73	26.5	2.85	"
42.22	9.54	48.24 [d]	28.2	2.43	"
42.74	9.26	52.00 [d]	28.7	2.37	"

[a] The mol/kg H_2O values were calculated by the compiler.

[b] The solid phases are: B = ZnO; C = $NaZn(OH)_3$; D = $Na_2Zn(OH)_4$.

[c] This appears to be an error. It probably should be 72.06.

[d] This appears to be an error. It probably should be 48.00.

COMPONENTS:

(1) Zinc oxide; ZnO; [1314-13-2]

(2) Sodium chloride; NaCl; [7647-14-5]

(3) Sodium hydroxide; NaOH; [1310-73-2]

(4) Water; H_2O; [7732-18-5]

ORIGINAL MEASUREMENTS

Urazov, G. G.; Lipshits, B. M. Lovchikov, V. S. *Tsvetnye Metal.* 1956, *29*, 37-42.

EXPERIMENTAL VALUES, contd:

Table III. Solubility in the system Na_2O-H_2O-ZnO at the boiling point of the solution.

t/°C	C_{Na_2O}/mass%	C_{ZnO}/mass%	C_{H_2O}/mass%	C_{NaOH}/mol kg^{-1} [a]	C_{ZnO}/mol kg^{-1} [a]	Solid phase [b]
121.0	14.5	4.8	80.7	5.80	0.73	B
133.5	24.8	15.0	60.2	13.3	3.06	"
145.0	28.6	19.2	52.2	17.7	4.52	"
155.0	31.0	25.8	43.2	23.1	7.34	"
- - -	33.25	29.9	36.85	29.1	9.97	"
- - -	43.4	30.0	26.60	52.6	13.9	"
269.0	45.7	27.9	26.40	55.8	13.0	E
315.0	52.31	23.5	24.19	69.8	11.9	"
- - -	63.2	16.4	20.40	99.9	9.88	"
- - -	68.43	7.9	23.67	93.3	4.10	"

[a] The mol/kg H_2O values were calculated by the compiler.

[b] The solid phases are: B = ZnO; E = $4[2ZnO \cdot Na_2O] \cdot 3H_2O$.

Table IV. Influence of NaCl on the solubility of ZnO in aqueous NaOH at 25.0°C.[a]

C_{NaOH}/mass%	C_{NaCl}/mass%	C_{Zn}/mass%
10.7	0	1.39
12.6	0	1.9
11.6	15.7	0.95
18.4	0	3.93
18.4	10.7	3.2
23.2	0	5.5
23.2	8.34	4.5
31.5	0	8.0
31.5	2.56	7.86

[a] The solutions apparently were saturated with respect to NaCl.

COMPONENTS:	ORIGINAL MEASUREMENTS
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium chloride; NaCl; [7647-14-5] (3) Sodium hydroxide; NaOH; [1310-73-2] (4) Water; H_2O; [7732-18-5]	Urazov, G. G.; Lipshits, B. M. Lovchikov, V. S. *Tsvetnye Metal.* 1956, *29*, 37-42.

EXPERIMENTAL VALUES, contd:

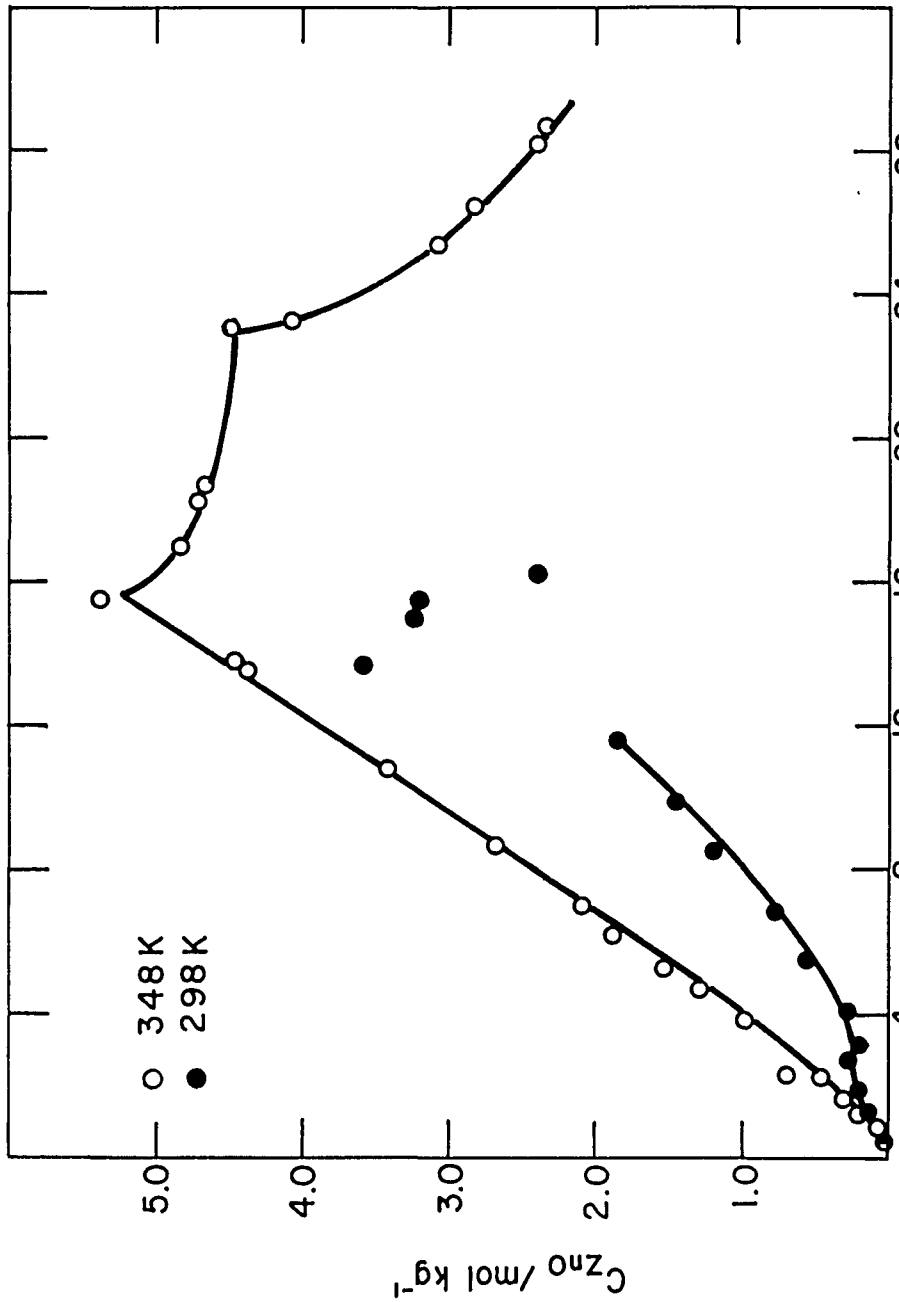

Figure 1. Solubility in the ZnO-Na_2O-H_2O system.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Chromium(VI) oxide; CrO_3; [1333-82-0] (3) Water; H_2O; [7732-18-5]	Woodward, A. E.; Allen, E. R.; Anderson, R. H. *J. Phys. Chem.* 1956, *60*, 939-43.
VARIABLES:	PREPARED BY:
Concentration of chromium(VI) oxide at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of equilibrium solutions of the $ZnO-CrO_3-H_2O$ system at 25°C.

mass% ZnO	mass% CrO_3	mass% ZnO	mass% CrO_3	mass% ZnO	mass% CrO_3
0.04	0.08	14.8	35.8	18.6	55.0
0.21	0.34	14.6	35.7	17.9	57.6
0.47	0.90	15.0	36.6	16.3	60.6
0.74	1.37	15.4	36.7	16.5	60.7
0.95	1.89	15.8	37.0	16.4	60.5
1.36	3.40	15.4	36.5	16.0	60.8
1.62	4.75	16.4	39.0	13.4	60.5
2.88	5.54	17.1	40.7	12.5	60.6
2.45	5.20	18.9	42.4	10.3	61.0
2.60	5.72	18.3	43.8	6.9	61.4
2.85	6.01	18.6	45.4	3.6	62.3
3.73	10.0	19.4	46.0		
6.00	15.5	19.4	47.0	<0.01	0.004
9.45	22.0	20.5	48.7	<0.01	0.006
10.1	24.1	21.1	51.0	<0.01	0.005
10.8	26.0	21.1	51.7	<0.01	0.002
11.5	27.7	21.1	52.0	<0.01	0.003
12.2	29.5	21.0	52.0	0.288	0.555
12.6	30.1	21.9	50.8	0.979	2.047
14.1	33.6	20.4	52.9	1.442	2.198
15.7	35.1	18.8	53.8	2.191	5.003

The solid phases identified were: $2ZnO \cdot CrO_3 \cdot H_2O$; $1.5ZnO \cdot CrO_3 \cdot 3H_2O$; $ZnO \cdot CrO_3 \cdot 2H_2O$; $ZnO \cdot 2CrO_3 \cdot 2H_2O$; CrO_3.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally by slowly rotating the mixtures in a constant temperature bath. Equilibrium was determined by analysis of samples every 3 to 4 days. Chromium content was determined iodometrically (1). Zinc content was determined volumetrically with $KBrO_3$ and $Na_2S_2O_3$ (2).

SOURCE AND PURITY OF MATERIALS:

Distilled water was used as solvent. All materials were of reagent grade quality.

ESTIMATED ERROR:

Duplicate results agreed to within 0.5%.

REFERENCES:

1. Brizzolara, A. A.; Denslow, R. R.; Rumbel, S. W. *Ind. Eng. Chem.* 1937, 29, 656.
2. Kolthoff, I. M.; Sandell, E. B.; *Textbook of Quantitative Inorganic Analysis*, 3rd Ed., The Macmillan Co., New York, 1952, 607.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sulfur dioxide; SO_2; [7446-09-5] (3) Water; H_2O; [7732-18-5]	Jager, L. *Chem. Prumysl.* 1957, 7, 544-5.
VARIABLES:	**PREPARED BY:**
Concentration of SO_2.	T. Michalowski

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous SO_2 at 20.0°C

mass % ZnO	C_{ZnO}/mol kg^{-1} [a]	mass % SO_2	C_{SO_2}/mol kg^{-1} [a]	Solid phase [b]
7.78	1.22	14.10	2.82	A
6.50	0.97	11.05	2.09	"
5.51	0.79	9.14	1.67	"
4.12	0.57	6.62	1.16	"
3.24	0.43	5.18	0.88	"
0.50	0.062	0.63	0.10	"
0.45	0.056	0.58	0.091	"
0.39	0.048	0.49	0.077	"
0.10	0.012	0.10	0.016	
0.090	0.011	0.086	0.013	B
0.039	0.005	0.024	0.004	"

[a] Calculated by the compiler.

[b] Solid phases are: A = $ZnSO_3 \cdot 5/2H_2O$; B = $2ZnSO_3 \cdot 3ZnO \cdot 3H_2O$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

A 10% suspension of ZnO in water was placed in a flask, and nitrogen was passed over it for 1/2 hour to remove oxygen. The suspension was treated with SO_2, the flask was closed and placed in a thermostat at 20.0°C. Equilibrium was reached in 10-14 days. SO_2 content was determined iodometrically and zinc content was measured by titration with EDTA.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

No information is given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Hydrogen peroxide; H_2O_2; [7722-84-1] (3) Water; H_2O; [7732-18-5]	Makarov, S. Z.; Ladeinova, L. V.; *Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk* 1957, 3-17; *Bull. Acad. Sci. USSR, Div. Chem. Sci.* (*Engl. transl.*) 1957, 1-15.
VARIABLES: Concentration of H_2O_2 and temperature.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES: Composition of saturated solutions of the $Zn(OH)_2$-H_2O_2-H_2O system at 30°C.

$C_{H_2O_2}$/wt %	$10^3 C_{ZnO}$/wt %	$C_{H_2O_2}$/mol kg^{-1} [a]	$10^4 C_{ZnO}$/mol kg^{-1} [a]	Solid phase [b]
- - -	1.03	- - -	1.27	A
1.92	6.08	0.58	7.62	A + B
6.27	4.28	1.97	5.61	B
8.45	8.13	2.71	10.9	"
11.83	10.68	3.95	14.9	"
13.43	12.10	4.56	17.3	"
15.68	24.30	5.47	35.4	B + C
19.89	12.18	7.30	18.7	C
26.09	9.42	10.38	15.7	"
34.60	4.68	15.56	8.80	"
40.74	8.90	20.22	18.5	"
42.18	8.93	21.46	19.0	D
43.00	5.70	22.19	12.3	"
44.18	4.10	23.28	9.02	"
55.27	1.15	36.34	3.16	"
55.77	4.25	37.09	11.8	"
57.16	14.25	39.25	40.9	"
58.33	22.58	41.19	66.6	D + E
62.25	5.57	48.51	18.1	E
67.51	2.43	61.11	9.19	"
78.61	0.78	108.1	4.48	"
82.52	1.98	138.8	13.9	E + F
85.31	0.77	170.8	6.44	F
86.98	0.75	196.5	7.08	"
88.45	0.53	225.2	5.64	"
93.23	0.78	405.0	14.2	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally by stirring the mixtures for 1.5 to 2 hours. Active oxygen was determined by titration with $KMnO_4$. Zinc content was measured colorimetrically with dithizone.	The hydrogen peroxide was vacuum distilled. The $Zn(OH)_2$ was prepared by adding NH_4OH to a solution of $Zn(NO_3)_2$.
	ESTIMATED ERROR: The temperature was controlled to within 0.5°C but no other details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide, $Zn(OH)_2$; [20427-58-1] (2) Hydrogen peroxide, H_2O_2; [7722-84-1] (3) Water, H_2O, [7732-18-5]	Makarov, S. Z.; Ladeinova, L. V. *Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk* 1957, 3-17, *Bull. Acad. Sci. USSR, Div. Chem. Sci. (Engl. transl.)* 1957, 1-15.

EXPERIMENTAL VALUES. contd.

Composition of saturated solutions of the $Zn(OH)_2$-H_2O_2-H_2O system.

$C_{H_2O_2}$/wt %	$10^3 C_{ZnO}$/wt %	$C_{H_2O_2}$/mol kg^{-1} [a]	$10^4 C_{ZnO}$/mol kg^{-1} [a]	Solid phase [b]
		temp., 20°C.		
----	1.80	----	2.21	A
0.45	0.52	0.13	0.64	"
1.67	3.13	0.50	3.91	"
3.48	9.30	1.06	11.8	A + B
4.72	4.18	1.46	5.39	B
7.62	2.19	2.43	2.91	"
9.23	1.87	2.99	2.53	"
12.94	1.72	4.37	2.43	"
18.19	17.86	6.54	26.8	"
21.43	16.23	8.02	25.4	D
26.04	2.14	10.36	3.55	"
28.20	1.62	11.55	2.77	"
38.30	1.13	18.26	2.25	"
43.86	2.53	22.98	5.54	"
46.54	10.94	25.61	25.1	D + E
50.66	4.29	30.20	10.7	E
54.00	2.37	34.53	6.33	"
57.50	12.90	39.80	37.3	"
57.98	27.78	40.61	81.3	E + F
60.29	5.42	44.67	16.8	F
72.35	4.23	76.96	18.8	"
83.07	4.44	144.3	32.2	"
86.15	8.31	183.1	73.8	F + G
88.68	3.84	230.4	41.7	G

[a] Data converted to mol/kg H_2O by the compiler.

[b] A = $Zn(OH)_2$; B = $ZnO_2 \cdot 2H_2O$; C = $ZnO_2 \cdot 1.5H_2O$; D = $ZnO_2 \cdot H_2O$; E = $ZnO_2 \cdot 0.5H_2O$; F = ZnO_2; G = $ZnO_2 \cdot H_2O_2$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1]	Makarov, S. Z.; Ladeinova, L. V. *Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk* 1957, 3-17; *Bull. Acad. Sci. USSR, Div. Chem. Sci. (Engl. transl.)* 1957, 1-15.
(2) Hydrogen peroxide; H_2O_2; [7722-84-1]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of the $Zn(OH)_2$-H_2O_2-H_2O system.

$C_{H_2O_2}$/wt %	$10^3 C_{ZnO}$/wt %	$C_{H_2O_2}$/mol kg^{-1} [a]	$10^4 C_{ZnO}$/mol kg^{-1} [a]	Solid phase [b]
		temp., 0°C		
----	0.63	----	0.77	A
0.07	0.74	0.02	0.91	A + B
3.50	0.44	1.07	0.56	B
6.25	0.39	1.96	0.51	"
9.08	1.43	2.94	1.93	"
10.36	3.42	3.40	4.69	"
13.96	3.66	4.77	5.23	"
15.09	9.01	5.23	13.0	B + D
19.42	5.77	7.09	8.80	D
23.83	1.11	9.20	1.79	"
27.16	2.36	10.97	3.98	"
28.34	5.23	11.63	8.97	D + E
32.10	1.65	13.90	2.99	E
34.74	1.29	15.66	2.43	"
40.24	4.29	19.80	8.82	"
40.93	5.00	20.38	10.4	E + F
43.65	1.98	22.78	4.32	F
43.81	0.63	22.93	1.38	"
50.77	1.06	30.33	2.65	"
54.83	0.86	35.70	2.34	"
63.77	1.29	51.77	4.37	"
73.82	2.01	82.93	9.43	"
74.38	19.72	85.45	94.6	F + G
79.83	7.76	116.5	47.3	G
90.15	1.05	269.2	13.1	"

[a] Data converted to mol/kg H_2O by the compiler.

[b] A = $Zn(OH)_2$; B = $ZnO_2 \cdot 2H_2O$; D = $ZnO_2 \cdot H_2O$; E = $ZnO_2 \cdot 0.5H_2O$; F = ZnO_2; G = $ZnO_2 \cdot H_2O_2$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Hydrogen peroxide, H_2O_2; [7722-84-1] (3) Water, H_2O; [7732-18-5]	Makarov, S. Z.; Ladeinova, L. V. *Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk* 1957, 3-17; *Bull. Acad. Sci. USSR, Div. Chem. Sci.* (*Engl. transl.*) 1957, 1-15.

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of the $Zn(OH)_2$-H_2O_2-H_2O system.

$C_{H_2O_2}$/wt %	$10^3 C_{ZnO}$/wt %	$C_{H_2O_2}$/mol kg^{-1} [a]	$10^4 C_{ZnO}$/mol kg^{-1} [a]	Solid phase [b]
		temp., -10°C.		
13.80	3.89	4.71	5.54	D
19.04	3.30	6.92	5.01	"
20.43	4.37	7.55	6.75	D + E
21.54	3.22	8.07	5.04	E
22.43	2.75	8.50	4.36	"
28.30	2.16	11.61	3.70	"
35.21	3.84	15.98	7.28	"
35.48	4.80	16.17	9.14	"
36.37	5.30	16.81	10.2	"
38.69	6.61	18.56	13.2	E + H
40.67	4.10	20.16	8.49	H
41.62	2.60	20.97	5.47	"
45.22	2.10	24.28	4.71	"
50.74	1.49	30.30	3.72	"
51.62	1.23	31.38	3.12	"
52.43	1.12	32.42	2.89	"
58.51	0.91	41.48	2.69	"
61.38	1.87	46.75	5.95	"
61.89	1.86	47.76	6.00	"
61.93	2.05	47.85	6.62	"
62.32	8.03	48.66	26.2	H + F
64.41	1.40	53.23	4.83	F
66.68	0.62	58.86	2.29	"
70.83	1.84	71.42	7.75	"
72.65	2.30	78.13	10.3	F + G
72.90	1.55	79.12	7.03	G
75.52	1.12	90.73	5.62	"
80.48	1.41	121.3	8.87	"
85.32	1.20	170.9	10.0	"
89.18	0.77	242.4	8.74	"

[a] Data converted to mol/kg H_2O by the compiler.

[b] D = $ZnO_2 \cdot H_2O$; E = $ZnO_2 \cdot 0.5H_2O$; F = ZnO_2; G = $ZnO_2 \cdot H_2O_2$; H = $ZnO_2 \cdot 0.5H_2O_2 \cdot H_2O$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Hydrogen peroxide; H_2O_2; [7722-84-1] (3) Water, H_2O, [7732-18-5]	Makarov, S. Z.; Ladeinova, L. V.; *Izvest. Akad. Nauk SSSR, Otdel. Khim. Nauk* 1957, 3-17; *Bull. Acad. Sci. USSR, Div. Chem. Sci. (Engl. transl.)* 1957, 1-15

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of the $Zn(OH)_2$-H_2O_2-H_2O system.

$C_{H_2O_2}$/wt %	$10^3 C_{ZnO}$/wt %	$C_{H_2O_2}$/mol kg^{-1} [a]	$10^4 C_{ZnO}$/mol kg^{-1} [a]	Solid phase [b]
		temp., -20°C		
30.09	3.37	12.66	5.92	E
36.87	4.32	17.18	8.41	"
38.96	4.99	18.77	10.0	"
40.23	27.80	19.81	57.2	E + H
41.51	4.03	20.87	8.46	H
41.74	3.29	21.07	6.94	"
47.52	1.33	26.63	3.11	"
48.03	7.44	27.19	17.6	H + F
48.78	2.79	28.01	6.69	F
54.02	2.02	34.55	5.40	"
56.76	2.13	38.61	6.05	"
63.43	1.50	51.01	5.04	"
63.47	1.36	51.10	4.57	"
64.47	1.65	53.37	5.71	"
66.63	1.20	58.73	4.42	"
69.86	4.07	68.17	1.51	"
70.78	7.82	71.27	32.9	F + G
71.63	2.98	74.26	12.9	G
71.71	1.88	74.55	8.16	"
73.31	0.84	80.79	3.87	"
76.25	1.48	94.43	7.66	"
77.55	2.53	101.6	13.8	G + I
79.23	0.52	112.2	3.08	I
81.66	1.62	131.0	10.9	"

a
Data converted to mol/kg H_2O by the compiler.

b
E = $ZnO_2 \cdot 0.5H_2O$; F = ZnO_2; G = $ZnO_2 \cdot H_2O_2$; H = $ZnO_2 \cdot 0.5H_2O_2 \cdot H_2O$;
I = $ZnO_2 \cdot 2H_2O_2$.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Dirkse, T. P. *J. Electrochem. Soc.* 1959, *106*, 154.
VARIABLES:	**PREPARED BY:**
Concentration of KOH and temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of ZnO in aqueous KOH.

mass% K	mol KOH/kg H_2O[a]	mass% Zn	mol ZnO/kg H_2O[a]
	temp., 44.6°C.		
10.05	3.03	0.80	0.15
17.62	6.28	2.30	0.49
22.1	17.83	4.33	1.05
31.8	18.03	7.48	2.54
34.4	22.6	9.29	3.65
34.7	24.4	11.05	4.66
38.6	22.7	0.81	0.28
38.8	23.8	2.03	0.74
38.3	24.1	3.49	1.31
39.1	24.7	2.78	1.05
40.1	25.9	2.29	0.88
	temp., 3°C.		
7.90	2.30	0.55	0.09
14.01	4.61	1.74	0.34
20.01	7.69	3.82	0.88
21.29	8.44	3.97	0.94
26.9	12.6	5.36	1.50
32.2	18.7	7.89	2.74
32.6	17.4	4.31	1.38

[a] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was approached from both undersaturation and supersaturation. The mixtures were allowed to stand with occasional shaking for several months. The mixtures were contained in Pyrex flasks and in polyethylene vessels. Zinc content was determined by titration with $K_4Fe(CN)_6$ and spectrophotometrically with dithizone[6](1). Potassium content was determined colorimetrically with dipicrylamine (2, 3).

SOURCE AND PURITY OF MATERIALS:

C. P. ZnO was added to carbonate-free KOH. Distilled water was used as solvent.

ESTIMATED ERROR:

Less than 1%.

REFERENCES:

1. Cowling, H.; Miller, E. J. *Ind. Eng. Chem., Anal. Ed.* 1941, *13*, 145.
2. Amdur, E. *Ind. Eng. Chem., Anal. Ed.* 1940, *12*, 731.
3. Faber, R.; Dirkse, T. P. *Anal. Chem.* 1953, *25*, 808.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2]	Dirkse, T. P. *J. Electrochem. Soc.* 1959, *106*, 154.
(2) Potassium hydroxide; KOH; [1310-58-3]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd.

Composition of saturated solutions of ZnO in aqueous KOH.

mass% K	mol KOH/kg H_2O[a]	mass% Zn	mol ZnO/kg H_2O[a]
	temp., -20°C.		
17.4	6.19	2.38	0.50
18.8	6.94	2.96	0.65
15.4	5.25	2.38	0.48
17.3	6.11	2.28	0.48
21.4	8.48	3.80	0.90
24.3	10.63	5.28	1.38
28.0	12.22	0.95	0.25
28.6	12.45	0.25	0.05
	temp., -30°C.		
17.1	6.03	2.43	0.51
19.4	7.24	3.04	0.68
17.4	6.19	2.46	0.52
21.9	8.77	3.85	0.92
24	10.3	4.89	1.26
29.9	13.55	0.52	0.14
30.8	14.22	0.32	0.09
	temp., 25°C.		
3.66	0.99	0.28	0.05
4.93	1.36	0.48	0.08
8.18	2.39	0.55	0.10
15.0	5.03	1.83	0.37
21.3	8.40	3.61	0.85
21.9	8.75	3.71	0.89
28.9	14.62	6.34	1.92
30.9	17.47	8.41	2.85
35.3	24.58	10.20	4.25
36.0	26.71	11.05	4.91
36.1	26.31	10.53	4.59
36.3	24.37	7.91	3.16
36.4	23.09	6.02	2.29
37.7	22.37	2.28	0.80

[a] Calculated by the compiler.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Landsberg, R.; Furtig, H.; Muller, L. *Wissen. Z. Techn. Hochscule fur Chemie Leuna-Merseburg* 1959/60, *2*, 453-8.
VARIABLES: Concentration of sodium hydroxide at 20 ± 0.2°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

The rate of dissolution (mol cm^{-2} s^{-1}) was measured in NaOH solutions containing varying amounts of dissolved ZnO. For a given NaOH concentration there was a linear relationship between the rate of dissolution and the concentration of ZnO. Extrapolation of this line to zero rate of dissolution gives the concentration of ZnO at saturation. The results obtained at 20°C are:

C_{NaOH}/mol dm^{-3}	C_{ZnO}/mol dm^{-3}
1	0.01
2	0.045
3	0.102
4	0.188

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Small compressed discs of ZnO were prepared, heated for 5 hours at 1000°C, attached to a rod which was rotated at 2055 rpm in a NaOH solution containing dissolved ZnO. The rate of dissolution of the ZnO in the disc was measured by taking samples of the solution at specified times and analyzing them for zinc content. Analysis was done polarimetrically in an ammoniacal solution (1).

SOURCE AND PURITY OF MATERIALS:

No information is given except about the ZnO.

ESTIMATED ERROR:

No information is given.

REFERENCES:

1. Eucken, Z. B. A.; Suhrmann, R. *Phys. -Chem. Praktikumsaufgaben* 1952, Leipzig.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium nitrate; KNO_3; [7757-79-1] (3) Water; H_2O; [7732-18-5]	Schindler, P.; Althaus, H.; Schurch, A.; Feitknecht, W. *Chimia* 1962, *16*, 42-4.
VARIABLES: pH of the solvent at 25.0°C.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in solutions of varying pH at 25.0°C.

$10^3 C_{H^+}$/mol dm^{-3} in solution before reaction with $Zn(OH)_2$	pH of solution after saturation	$10^3 C_{Zn^{2+}}$/mol dm^{-3}	log $*K_s o$ [a]	$Zn(OH)_2$ prep.
10.00	7.018	5.02	11.74	a
6.67	7.114	3.31	11.75	b
5.00	7.187	2.39	11.75	b
4.00	7.228	1.94	11.75	b
3.33	7.255	1.65	11.73	b
2.00	7.391	0.97	11.77	b
1.00	7.549	0.48	11.78	a
0.40	7.697	0.23	11.7_5	b
0.10	8.049	0.04	11.7_3	a

[a] $*K_s o = (C_{Zn^{2+}}) \cdot (C_{H^+})^{-2}$ for the reaction $\varepsilon Zn(OH)_2$ (s) + $2H^+ = Zn^{2+} + 2H_2O$

The average log $*K_s o$ = 11.75 ± 0.03 at 25°C in 0.2 mol KNO_3 dm^{-3}.

Using log K_w = -13.70 ± 0.02 at 25°C in 0.2 mol KNO_3 dm^{-3} the value of log $K_s o$ is calculated to be -15.65 ± 0.05 at 25°C in 0.2 mol KNO_3 dm^{-3}.

Using approximations for activity coefficients (3) the value of log $K_s o$ at 25°C and zero ionic strength is calculated to be -16.5 ± 0.1.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The solvent was forced through the solid in a closed container. This was done 10 to 20 times and the pH of the solvent was determined by measuring the e.m.f. across a glass electrode and a Ag/AgCl electrode immersed in the solvent. After the pH became constant a sample of the solution was removed and analyzed for zinc content by a complexometric titration. The pH of the solvent was adjusted by the addition of HNO_3. The ionic strength in all solutions was 0.2 mol KNO_3 dm^{-3}.

SOURCE AND PURITY OF MATERIALS:

All materials were of reagent grade quality. The ε-$Zn(OH)_2$ was prepared in 2 ways; (a) by the method of Dietrich and Johnston (1); and (b) by the method described by Feitknecht (2).

ESTIMATED ERROR:

The authors give no details but the uncertainty in the final results appears to be less than 5%.

REFERENCES:

1. Dietrich, H. G.; Johnston, J. *J. Am. Chem. Soc.* 1927, *49*, 1419.
2. Feitknecht, W. *Helv. Chim. Acta* 1930, *13*, 314.
3. Guggenheim, E. A. *Phil. Mag.* 1935, *19*, 588.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Laudise, R. A.; Kolb, E. D. *Am. Mineral.* 1963, *48*, 642.
VARIABLES:	**PREPARED BY:**
Temperature.	F. Izumi

EXPERIMENTAL VALUES:

Solubilities of ZnO in 6.47 mol kg^{-1} KOH were measured at 55 MPa. They were 4.62% at 360°C and 3.57% at 200°C. These values were calculated as (weight of ZnO dissolved) x 100/(weight of H_2O + weight of KOH).

This paper also presents graphical data on solubilities of ZnO in aqueous solutions of KOH and NaOH.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solubilities were determined by means of weight loss determinations carried out on crystalline ZnO contained in welded platinum capsules filled with the basic solutions. The capsules were heated in Tuttle-type pressure vessels, and the pressure was established by pumping water into these vessels.

SOURCE AND PURITY OF MATERIALS:

All materials were of reagent grade purity. The crystalline ZnO was obtained by selection from spontaneously nucleated crystals formed in hydrothermal growth runs.

ESTIMATED ERROR:

Temperature: within ± 3°C.
Pressure: within ± 3 MPa.
Solubility: within ± 0.09% for 360°C and within ± 0.16% for 200°C.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Potassium nitrate; KNO_3; [7757-79-1] (3) Water; H_2O; [7732-18-5]	Pinto, L.; Egger, K.; Schindler, P. *Helv. Chim. Acta* 1963, *46*, 425-7.
VARIABLES:	**PREPARED BY:**
pH of the solvent at 25°C in 0.2 mol KNO_3 dm^{-3}.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of saturated solutions of ε-$Zn(OH)_2$ in aqueous solutions of varying pH.[a]

$-\log (C_{H^+}/\text{mol dm}^{-3})$	$-\log (C_{Zn^{2+}}/\text{mol dm}^{-3})$	$\log {}^*K_s{}^o$[b]
7.93_9	4.14_0	11.74
7.93^5	4.15_3	11.72
7.88_7	4.06_2	11.71
7.77_7	3.81_9	11.74
7.60_7	3.50_4	11.71
7.46_7	3.22_3	11.71
7.36_3	3.02_9	11.70
7.28_5	2.84_2	11.73
7.22_2	2.73_4	11.71

[a] This work is a repeat of earlier work (2) except that a more sensitive method is used for the analysis of zinc.

[b] ${}^*K_s{}^o = (C_{Zn^{2+}}) \cdot (C_{H^+})^{-2}$

The average value of $\log {}^*K_s{}^o = 11.72 \pm 0.02$ at 25°C in 2 mol KNO_3 dm^{-3}

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The solvent, containing HNO_3 and KNO_3, was passed through samples of solid ε-$Zn(OH)_2$ in a closed tube and the pH of the solvent was determined by measuring the e.m.f. between a glass electrode and a Ag/AgCl electrode inserted in the solvent. This process was repeated until the pH of the solvent became constant. Then a sample of the solution was removed and analyzed for zinc content. Zinc analysis was done by means of a ^{65}Zn radioactive tracer. All solutions had an ionic strength of 0.2 mol KNO_3 dm^{-3}. The work was carried out only at 25°C.

SOURCE AND PURITY OF MATERIALS:

All materials were of reagent grade quality. The ε-$Zn(OH)_2$ was prepared by the method described by others (1).

ESTIMATED ERROR:

The uncertainty in the values appears to be less than 5%.

REFERENCES:

1. Dietrich, H. G.; Johnston, J. *J. Am. Chem. Soc.* 1927, *49*, 1419.
2. Schindler, P.; Althaus, H.; Schurch, A.; Feitknecht, W. *Chimia* 1962, *16*, 42.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium perchlorate; $NaClO_4$; [7601-89-0] (3) Water; H_2O; [7732-18-5]	Schindler, P.; Althaus, H.; Hofer, F.; Minder, W. *Helv. Chim. Acta* 1965, *48*, 1204-15.
VARIABLES:	**PREPARED BY:**
Particle size and molar surface area of the ZnO.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility constants of ZnO at 25°C.[a]

S/m^2 [b]	log $*K_s^o$ [c]
1290	11.56 ± 0.02
1490	11.54 ± 0.02
1960	11.55 ± 0.02
540	11.47 ± 0.02
870	11.45 ± 0.02
280	11.42 ± 0.02
40	11.39 ± 0.02

[a] Each result is the average of 6 to 8 determinations. All results are for a solution containing 0.2 mol $NaClO_4$ dm^{-3}.

[b] S is the molar surface area.

[c] $*K_s^o = K_s^o/(K_w)^2$

The above data can be represented by the following equation with a 90% confidence level.

$$\log *K_s^o = (11.40 \pm 0.04) + (9.0 \pm 3.5) \times 10^{-5} S.$$

Using $K_w = -13.70 \pm 0.02$, the following values are calculated:

$\log K_s^o = -16.00 \pm 0.04$ and $\log K_s^{\circ o} = -16.82 \pm 0.04$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The ZnO was placed in a column and the solvent (water containing 0.2 mol $NaClO_4$ dm^{-3}) was forced through the column 10 to 20 times until the pH of the solution became constant. A sample of the solution was removed and analyzed for zinc content by a complexiметric titration. The pH was determined by measuring the e.m.f. across a glass electrode and a AgCl/Ag electrode placed in the solution. All measurements were made at 25.0 ± 0.5°C. The method of Davies (1) was used to obtain the thermodynamic solubility product constant.

SOURCE AND PURITY OF MATERIALS:

The ZnO was prepared (a) by thermal decomposition of zinc oxalate, (b) by dehydrating ε-$Zn(OH)_2$ at 80°C for 60 hours in a vacuum over soda lime, and (c) by adding, with intense stirring, equivalent quantities of aqueous NaOH and aqueous $Zn(ClO_4)_2$ and allowing the precipitate to stand for 1 week in contact with the solution.

ESTIMATED ERROR:

This is indicated for each result that is reported.

REFERENCES:

1. Davies, C. W. *Ion Association*, Butterworths, London 1960, p. 41.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-14-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Baker, C. T.; Trachtenberg, I. *J. Electrochem Soc.* 1967, *114*, 1045-6.
VARIABLES: Concentration of KOH and temperature.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Table I. Solubility of ZnO in aqueous KOH at 25°C.

C_{KOH}/wt %[a]	C_{KOH}/mol dm^{-3}[a]	C_{Zn}/mol dm^{-3}
25	5.5	0.45
30	6.9	0.64
34	8.1	0.83
36.3	8.7	0.95

[a]Values of KOH concentration before saturation with ZnO.

Table II. Effect of temperature on the solubility of ZnO in 36.3 wt % KOH.

t/°C.	C_{Zn}/mol dm^{-3}
-62	0.92
-51	0.92
-30	0.95
-30	0.94
-26	0.97
-10	0.92
0	0.94
+26	0.97

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The mixtures were agitated periodically by means of an ultrasonic bath over a three-day span. No details are given for the analytical procedures. The temperatures were controlled to within 0.5°C.

SOURCE AND PURITY OF MATERIALS:

Reagent grade materials were used. Care was taken to exclude CO_2. The solvent was deionized water.

ESTIMATED ERROR:

No details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium perchlorate; $NaClO_4$; [7601-89-0] (3) Water; H_2O; [7732-18-5]	Gubeli, A. O.; Ste. Marie, J. *Can. J. Chem.* 1967, *45*, 827-32.
VARIABLES:	**PREPARED BY:**
pH of the solution at 25°C	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ as a function of pH at 25°C.

pH	pZn_{tot}	pH	pZn_{tot}
6.84	2.31	9.20	5.29
6.85	2.43	9.70	5.46
6.87	2.38	10.18	5.57
6.90	2.61	10.30	5.37
7.02	2.70	10.58	5.26
7.63	3.96	10.88	4.98
7.82	4.24	11.07	4.64
8.06	4.51	11.10	4.69
8.24	4.63	11.42	4.19
8.48	4.88	11.52	4.06
8.77	5.02	11.76	3.54
9.10	5.19		

The authors assume the following general reaction

$$Zn^{2+} + x\ OH^- = Zn(OH)_x^{2-x} \qquad (1)$$

for which $$\phi_x = [Zn(OH)_x^{2-x}] / [Zn^{2+}] \cdot [OH^-]^x \qquad (2)$$

Equation (2), by substitution and rearrangement, becomes

$$[Zn(OH)_x^{2-x}] = \phi \cdot K_{so} \cdot (K_w)^{x-2} \cdot [H+]^{2-x} \qquad (3)$$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

It is not clear whether mixtures were prepared using solid $Zn(OH)_2$ or whether $Zn(OH)_2$ was precipitated from solutions of Zn^{2+} ions. The solutions contained ^{65}Zn as a radioactive tracer and were all at an ionic strength of 1 mol dm^{-3} (maintained by the $NaClO_4$). The pH of the solutions was adjusted by adding either $HClO_4$ or NaOH. Mixtures were agitated for several days in a constant temperature bath. The solutions were then allowed to settle for 5 or 6 days. After this, samples were taken for analysis. Zinc content was determined by measuring the radioactivity of the solutions. pH was determined potentiometrically using calomel and glass electrodes.

SOURCE AND PURITY OF MATERIALS:

No information is given. CO_2 and O_2 were excluded from the solutions.

ESTIMATED ERROR:

No information is given except as indicated in the derived values for the various constants.

REFERENCES:

1. Gubeli, A. O.; Ste. Marie, J. *Can. J. Chem.* 1968, *46*, 1707.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium perchlorate, $NaClO_4$, [7601-89-0] (3) Water, H_2O, [7732-18-5]	Gubeli, A. O.; Ste. Marie, J. *Can. J. Chem.* 1967, *45*, 827-32.

EXPERIMENTAL VALUES: con't

From equation (3)

$$\frac{d \log [Zn(OH)_x^{2-x}]}{d\ pH} = x-2 \qquad (4)$$

A plot of log $[Zn(OH)_x^{2-x}]$ vs pH is made from the solubility data, Figure 1. The slopes of the plot then indicate the pH regions where certain $Zn(OH)_x^{2-x}$ species are predominant. These species are: Zn^{2+}, $ZnOH^+$, $Zn(OH)_2$, $Zn(OH)_3^-$ and $Zn(OH)_4^{2-}$.

From the solubility data measurements and substitution in equations similar to (3) above, enough equations can be written that, when solved simultaneously, give values for ϕ_x. The values obtained at 25°C are:

$$p\phi_1 = -6.31 \pm 0.07$$

$$p\phi_2 = -11.19 \pm 0.05$$

$$p\phi_3 = -14.31 \pm 0.06$$

$$p\phi_4 = -17.70 \pm 0.05$$

The value of pK_{so} (= 16.76 ± 0.03) was obtained from similar work by the authors (1).

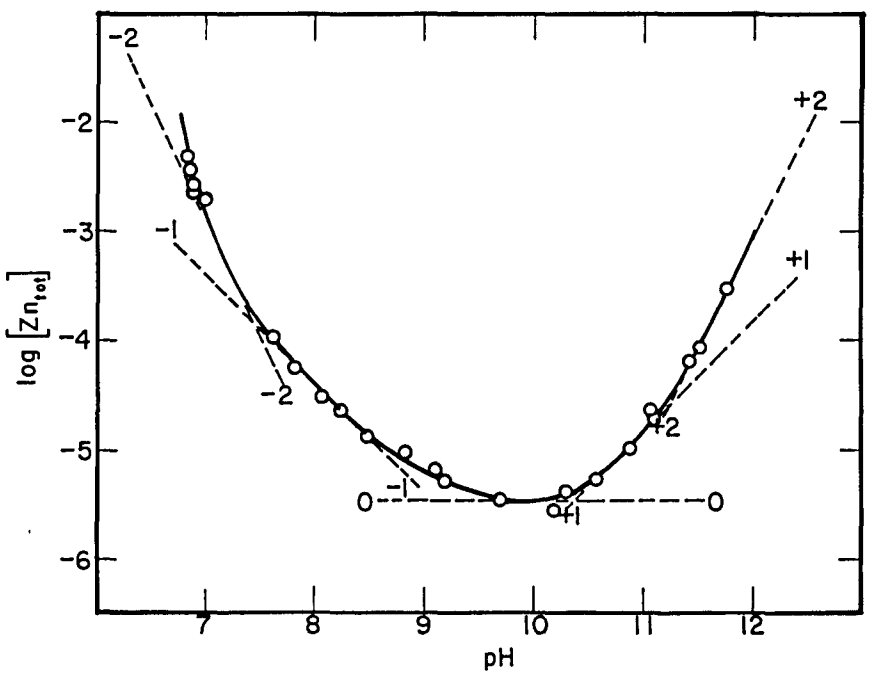

Figure 1. Solubility of $Zn(OH)_2$ as a function of pH at 25°C.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium sulfide; Na_2S; [1313-82-2] (3) Water; H_2O; [7732-18-5]	Polyvyannyi, I. R.; Milyutina, N. A. *Tr. Inst. Metal. Obogashch. AN Kaz. SSR* 1967, *21*, 3-13.
VARIABLES:	**PREPARED BY:**
Concentration of sodium sulfide at 60.0°C.	T. Michalowski

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous Na_2S at 60.0°C.

Initial concentration of Na_2S	1.53 mol dm^{-3}
Density of saturated solution	1.11 g ml^{-1}
Equilibrium concentration of Zn	5.5×10^{-3} mol dm^{-3}
Ionic strength	4.612 mol dm^{-3}

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally by agitation for 24 hours. No information is given about the analytical procedures.

SOURCE AND PURITY OF MATERIALS:

Reagent grade ZnO and Na_2S used. The Na_2S was recrystallized three times.

ESTIMATED ERROR:

No information is given about the reproducibility of any of the procedures.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Dyson, W. H.; Schrier, L. A.; Sholette, W. P. Salkind, A. J. *J. Electrochem. Soc.* 1968, *115*, 566-9.
VARIABLES:	PREPARED BY:
Concentration of KOH and temperature	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous KOH at 25°C

C_{KOH}/mass %[a]	C_{ZnO}/mass %	C_{KOH}/mol kg^{-1}[b]	C_{ZnO}/mol kg^{-1}[b]
46	8.3	17.94	2.23
40	6.5	13.33	1.49
35	5.2	10.43	1.07

[a] This is the KOH concentration before the ZnO was added.

[b] Data converted to mol/kg H_2O by the compiler.

No other numerical data are included in the paper. However, solubility studies were also made at 10°, 55°, and the temperature range up to 145°C. These data are presented graphically and indicate that over this temperature range the solubility of ZnO in the KOH solutions listed in the above table is practically independent of the temperature.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Excess ZnO was added to KOH solutions saturated with ZnO at room temperature. The mixtures were agitated for at least 2 days in a water bath. At the higher temperatures, the mixtures were contained in stainless steel bombs. Zinc content was determined by titration with EDTA. Potassium content (for KOH) was determined by titrating amperometrically with tetraphenylborate.	Reagent grade materials were used.
	ESTIMATED ERROR: Limits of experimental error were 0.05% for ZnO and 0.25% for KOH.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Ammonium hydroxide; NH_4OH; [1336-21-6] (3) Water; H_2O; [7732-18-5]	Gubeli, A. O.; Ste. Marie, J. *Can. J. Chem.* 1968, *46*, 1707-14.
VARIABLES: pH and concentration of ammonium hydroxide	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ as a function of pH in the presence of NH_3.

C_{NH_3}/mol dm^{-3}	pH	pZn	C_{NH_3}/mol dm^{-3}	pH	pZn
0.005	6.80	2.49	0.02	8.27	4.89
"	6.87	2.71	"	8.83	4.63
"	7.30	3.58	"	8.89	4.62
"	7.69	4.06	"	9.04	4.59
"	7.71	4.22	"	9.25	4.48
"	7.95	4.79	"	9.67	4.59
"	8.48	5.41	"	9.82	4.53
"	8.96	5.81	"	11.12	4.22
"	9.60	5.75	"	12.08	3.48
"	10.63	5.27			
"	11.35	4.76	0.04	8.64	3.74
"	11.94	4.23	"	8.76	3.68
"	12.00	4.11	"	8.87	3.64
"	12.02	4.11	"	9.08	3.55
			"	9.20	3.49
0.02	6.63	2.14	"	9.33	3.41
"	6.80	2.19	"	9.46	3.36
"	6.87	2.24	"	9.60	3.38
"	6.88	2.31	"	9.68	3.55
"	6.92	2.50	"	9.80	3.61
"	6.94	2.63	"	10.64	3.93
"	7.05	2.95	"	11.15	3.68
"	7.07	2.90	"	12.31	2.84
"	7.37	3.62	"	12.47	2.75

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Three series of solutions were prepared. These series contained NH_4OH concentrations of 0.005, 0.02 and 0.04 mol dm^{-3}. The total ionic strength of each solution was 1 mol dm^{-3} and was attained by the presence of $NaClO_4$. These solutions were equilibrated with solid $Zn(OH)_2$ by vigorous agitation for several days in a constant temperature bath at 25°C. After the solutions were quiescent for 5 or 6 days, samples were taken for analysis. pH was determined with a glass electrode. Zinc content was determined by counting of radioactivity due to ^{65}Zn. The pH was adjusted by adding either $HClO_4$ or NaOH.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

No information is given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Ammonium hydroxide; NH_4OH; [1336-21-6] (3) Water; H_2O, [7732-18-5]	Gubeli, A. O.; Ste. Marie, J. *Can. J. Chem.* 1968, *46*, 1707-14.

ADDITIONAL COMMENTS:

The authors analyzed these results by writing general equations for the formation of all possible $Zn(OH)_x(NH_3)_y$ compounds. From these equations they calculated the theoretical slopes of the C_{Zn}^x vs pH and C_{Zn} vs pNH_3 plots for each of these compounds. Comparing these theoretical slopes with those obtained experimentally they concluded that, within the limits of pH and pNH_3 used in this study, the main species are: $Zn(OH)_2$, $Zn(OH)_3(NH_3)^-$ and $Zn(NH_3)_4^{2+}$. Basic to this is the assumption that zinc has a coordination number of 4.

Using the appropriate experimental data, the authors then deduced values for various constants associated with these compounds.

For $Zn(OH)_2$ they deduced $pK_{s0_2} = 16.76 \pm 0.03$ at 25°C. This was based on 15 experimental points. $K_{s0}^2 = C_{Zn^{2+}} \cdot (a_{OH^-})^2$.

The value of the formation constant of $Zn(NH_3)_4^{2+}$ was calculated from 10 experimental points and the result is given as $pK_{04} = -10.84 \pm 0.13$ at 25°C.

The value for the formation constant of $Zn(OH)_3(NH_3)^-$ was calculated from 7 experimental points and the result is given as $pK_{31} = -16.94 \pm 0.04$ at 25°C.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Magnesium chloride; $MgCl_2$; [7786-30-3] (3) Water; H_2O; [7732-18-5]	Adilova, A. A.; Taraskin, D. A. *Tr. Inst. Met. Obogashch., Akad. Nauk Kaz. SSR* 1969, *30*, 45-6.
VARIABLES: Concentration of $MgCl_2$ at temperatures of 20, 40, 60 and 80°C.	**PREPARED BY:** T. Michalowski

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in aqueous $MgCl_2$.

t/°C	C_{Zn}/g dm^{-3}	C_{MgCl_2}/g dm^{-3}	C_{Zn}/mol dm^{-3} [a]	C_{MgCl_2}/mol dm^{-3} [a]	pH
20	0.001	52.1	1.5×10^{-5}	0.547	8.05
20	0.005	128.2	7.7×10^{-5}	1.346	7.80
20	0.330	175.0	0.0050	1.838	7.09
20	3.860	283.8	0.059	2.980	6.76
40	0.001	53.3	1.5×10^{-5}	0.560	7.96
40	0.080	122.0	0.0012	1.281	7.72
40	1.530	187.4	0.023	1.968	7.03
40	4.530	288.0	0.069	3.024	6.73
60	0.002	51.8	3.1×10^{-5}	0.544	7.91
60	0.150	129.3	0.0023	1.358	7.67
60	1.780	183.9	0.027	1.931	6.75
60	4.820	289.1	0.074	3.036	6.68
80	0.003	52.3	4.6×10^{-5}	0.549	7.90
80	0.180	117.8	0.0028	1.237	7.48
80	2.070	182.5	0.032	1.916	6.61
80	5.480	287.2	0.084	3.016	6.63

[a] Calculated by the editor.

Editor's note: There is no indication that the precipitate was analyzed and shown to be $Zn(OH)_2$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Mixtures of $Zn(OH)_2$ and $MgCl_2$ solutions were agitated in a thermostated (±0.1°C) flask for 11 hours. After filtration the filtrate was analyzed for zinc by polarography. No details are given as to how the pH was measured.	$Zn(OH)_2$ was prepared by using equivalent amounts of $ZnCl_2$ (analytical grade) and NaOH. The precipitate was washed repeatedly with water. The $MgCl_2$ (a pure grade) was recrystallized before being used.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Glycine; $C_2H_5NO_2$; [56-40-6] (3) Water; H_2O; [7732-18-5]	Gorzelany, W.; Kulikow, E.; Jablonski, Z. *Rocz. Chem.* 1972, *46*, 781-6.
VARIABLES: Concentration of glycine.	PREPARED BY: T. Michalowski

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous solutions of glycine.

$C_{glycine}$/mol dm^{-3}	C_{ZnO}/mol dm^{-3}	$10^4 C_{GL^-}$/mol dm^{-3} [a]	pH
0.01	0.002	1.42	7.95
0.05	0.014	5.60	7.85
0.10	0.034	7.92	7.70
0.15	0.054	9.68	7.61
0.20	0.075	11.20	7.55
0.25	0.097	12.50	7.50
0.30	0.118	14.30	7.48

[a] GL^- is the $C_2H_4NO_2^-$ ion.

On the basis of the above results and some work with paper electrophoresis, the authors conclude that the following complexes are formed: $ZnGL_2$ and $ZnGL_2(OH)_2^{2-}$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The mixtures were placed in closed flasks at 22°C and shaken. Equilibrium was reached in 8 to 10 hours. The zinc content of the saturated solutions was determined by titration with EDTA. The concentration of the $C_2H_4NO_2^-$ ion was calculated from the pH and the acid dissociation constant of glycine (1.58×10^{-10}).	The water was doubly distilled. The glycine and ZnO were of analytical grade.
	ESTIMATED ERROR: No information is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Phosphoric acid; H_3PO_4; [7664-38-2] (3) Water; H_2O; [7732-18-5]	Kozina, T. M.; Lepilina, R. G.; *Zh. Prikład. Khim.* 1973, *46*, 812-6; *J. Applied Chem. USSR* (*Engl. transl.*) 1973, *46*, 861-4.
VARIABLES:	PREPARED BY:
Concentration of phosphoric acid at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of solutions of the $ZnO-P_2O_5-H_2O$ system at 25°C.

mass % P_2O_5	mass % ZnO	$C_{P_2O_5}$/mol kg^{-1} [a]	C_{ZnO}/mol kg^{-1} [a]
60	4.0	11.73	1.37
60.5	3.4	11.80	1.16
61	2.8	11.86	0.95
64.5	2.2	13.64	0.81

[a] The data were converted to mol/kg H_2O by the compiler.

The purpose of this work was to establish the conditions under which various zinc phosphates would crystallize out of solution. For the solutions described in the above Table, the solid phase was $Zn(H_2PO_4)_2 \cdot 2H_3PO_4$. Other zinc phosphates are discussed in the article. However, the conditions described for the crystallization of these other zinc phosphates did not involve the solubilities of either ZnO or $Zn(OH)_2$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally in a closed reactor with intensive stirring. Equilibrium was verified by chemical analysis every 3 to 6 hours. The zinc content was determined by a complexiметric titration. P_2O_5 was determined by differential colorimetry of the phosphovanadomolybdate complex (1).	No details are given except that 95% phosphoric acid was used.
	ESTIMATED ERROR:
	No details are given.
	REFERENCES:
	1. Moizhes, I. B.; Kuz'menko, M. V.; Kushnir, V. I. *Fosfornaya Prom.* 1970, 3.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) 2,2',2''-nitrilotriethanol; $C_6H_{15}NO_3$; [102-71-6] (3) Water; H_2O; [7732-18-5]	Mikulski, T.; Kwiecinska, A. *Pr. Nauk, Inst. Chem. Nieorg. Met. Pierwiastkow Rzadkich Politech. Wroclaw* 1973, *16*, 253-7.
VARIABLES: Concentration of the 2,2',2''-nitrilotriethanol.	**PREPARED BY:** T. Michalowski

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous 2,2',2''-nitrilotriethanol.

C_{TEA}/g l^{-1} [a]	C_{TEA}/mol dm^{-3} [a,b]	C_{ZnO}/g l^{-1}	C_{ZnO}/mol dm^{-3} [b]
50	0.34	0.065	8.0×10^{-4}
100	0.67	0.21	2.6×10^{-3}
200	1.34	0.65	8.0×10^{-3}

[a] TEA (triethanolamine) is the 2,2',2''-nitrilotriethanol.

[b] Calculated by the compiler.

The solubility of ZnO was also measured in aqueous solutions of ethylene diamine and of 2-aminoethanol (monoethanolamine), but these data (4 experimental points for each system) are given only in graphical form.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The samples of ZnO were placed in conical flasks, treated with solutions of the amine and shaken for 1 hour on a mechanical shaker. After centrifugation, the quantity of zinc in solution was determined by titration with EDTA. No temperature is specified.	No information is given.
	ESTIMATED ERROR: No information is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc hydroxide; $Zn(OH)_2$; [20427-58-1] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Ponomaryeva, E. I.; Solovyeva, V. D.; Svirchevskaya, E. G.; Orlova, L.F.; Yusupova, E. N. *Tr. Inst. Metal Obogashch. Akad. Nauk Kaz. SSR* 1973, *49*, 59-65.
VARIABLES: Concentration of NaOH and age of $Zn(OH)_2$ precipitate at 25°C.	PREPARED BY: T. Michalowski

EXPERIMENTAL VALUES:

Solubility of $Zn(OH)_2$ in NaOH solutions at 25°C.[a]

Solid phase	5 mol NaOH dm^{-3}	7.5 mol NaOH dm^{-3}
Freshly precipitated $Zn(OH)_2$	39.2 g dm^{-3}	80.1 g dm^{-3}
$Zn(OH)_2$ aged for 1 month	32.7 g dm^{-3}	60.0 g dm^{-3}
$Zn(OH)_2$ aged for 6 months	29.9 g dm^{-3}	56.0 g dm^{-3}

In another experiment using only 7.5 mol NaOH dm^{-3} as solvent and shaking the mixture for 30 days, the following results are reported.

Freshly precipitated $Zn(OH)_2$	80.0 g dm^{-3}
$Zn(OH)_2$ aged for 1 month	78.2 g dm^{-3}
$Zn(OH)_2$ aged for 6 months	74.9 g dm^{-3}

[a] There is no indication whether the g dm^{-3} values refer to Zn, ZnO, or $Zn(OH)_2$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Equilibrium was reached isothermally at room temperature (said to be 25°C) by shaking for 60 days on a mechanical shaker. No information is given about any analytical procedures.

SOURCE AND PURITY OF MATERIALS:

The $Zn(OH)_2$ presumably was prepared by the addition of NaOH to a solution of $ZnSO_4$ (1). The precipitate was washed twice with distilled water. It was kept in a moist state in a closed flask.

ESTIMATED ERROR:

This cannot be estimated because of lack of sufficient information.

REFERENCES:

1. Soloveva, V. D.; Bobrova, V. V.; Orlova, L. F.; Adeyschvili, E. U. *Tr. Inst. Metal. Obogashch. Akad. Nauk Kaz. SSR* 1973, *49*, 45.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Khodakovskii, I. L.; Yelkin, A.E. *Geokhimiya* 1975, No. 10, 1490-8; *Geochem. Int. (Engl. transl.)* 1975, *12*, 127-33.
VARIABLES: Concentration of NaOH and temperature.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of ZnO in aqueous NaOH

C_{NaOH}/mol kg^{-1}	$10^6 C_{Zn}$/mol kg^{-1}		
	100°C	150°C	200°C
0.00	31 ± 3	43 ± 15	49 ± 8
0.00045	1.8	4.6 ± 1.5	6.9
0.0016	2.8 ± 0.4	3.1	4.9 ± 1.0
0.005	6.1	7.6	6.9 ± 1.5
0.0095	11.5 ± 0.5	13.8	13.8 ± 2.5
0.018	-----	27.8	-----
0.0246	-----	37.4 ± 0.8	-----
0.0435	64 ± 10	-----	84 ± 8
0.058	-----	93.9	-----
0.076	-----	137.7	-----
0.087	127	164	192 ± 2

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The mixtures were contained in an autoclave and the pressure was approximately the saturated vapor pressure of pure water at the working temperature. Equilibrium was determined by analysis for zinc content. This was done by atomic absorption spectrophotometry.

SOURCE AND PURITY OF MATERIALS:

Double distilled water was used. The NaOH solutions were carbonate-free. No other details concerning purity are given.

ESTIMATED ERROR:

No details are given but the results given in the Table are averages of up to four separate determinations.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Arsenic(V) oxide; As_2O_5; [1303-28-2] (3) Water; H_2O; [7732-18-5]	Elghorche-Choubani, C.; Kbir-Ariguib, N.; Saugier-Cohen Adad, M. *Bull. Soc. Chim. Fr.* 1981, No. 7-8, 305-8.
VARIABLES:	PREPARED BY:
Concentration of As_2O_5 at 20°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Composition of equilibrium solutions of the $ZnO-As_2O_5-H_2O$ system at 20°C.

mass % As_2O_5	mass % ZnO	Solid phase[a]	$C_{As_2O_5}$/mol kg^{-1}[b]	C_{ZnO}/mol kg^{-1}[b]
0.2	- - -	A	0.0087	- - -
0.3	0.2	"	0.013	0.025
0.3	0.2	A + B	0.013	0.025
0.4	0.1	B	0.017	0.012
0.4	0.1	"	0.017	0.012
0.4	0.2	B + C	0.018	0.025
0.4	0.2	C	0.018	0.025
0.5	0.3	"	0.022	0.037
0.5	0.4	C + D	0.022	0.050
0.6	0.4	D	0.026	0.050
0.7	0.3	"	0.031	0.037
0.8	0.2	"	0.035	0.025
2.5	0.4	"	0.112	0.051
3.0	0.4	"	0.135	0.051
3.7	1.3	"	0.169	0.168

[a] A = $5ZnO \cdot As_2O_5 \cdot H_2O$; B = $4ZnO \cdot As_2O_5 \cdot H_2O$; C = $3ZnO \cdot As_2O_5 \cdot 8H_2O$; D = $2ZnO \cdot As_2O_5 \cdot 3H_2O$.

[b] The data were converted to mol/kg H_2O by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Mixtures of ZnO and aqueous As_2O_5 were allowed to reach equilibrium isothermally. This sometimes required several months. Zinc content was determined by a complexiметric titration. Arsenic was determined by an iodometric titration (1). The composition of the solid phases was determined by the wet-residues method of Schreinemakers.

SOURCE AND PURITY OF MATERIALS:

The ZnO was of reagent grade quality. As_2O_5 was prepared by the oxidation of As_2O_3 (2).

ESTIMATED ERROR:

No details are given

REFERENCES:

1. Fleury, P. *J. Pharm. Chim.* 1920, *21*, 385.

2. Guerin, H. *Bull. Soc. Chim. Fr.* 1955, 1536.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Zinc oxide; ZnO; [1314-13-2] (2) Arsenic(V) oxide; As_2O_5; [1303-28-2] (3) Water; H_2O; [7732-18-5]	Elghorche-Choubani, C.; Kbir-Ariguib, N.; Saugier-Cohen Adad, M. *Bull. Soc. Chim. Fr.* 1981, No. 7-8, 305-8.

EXPERIMENTAL VALUES, contd.

Composition of equilibrium solutions of the $ZnO-As_2O_5-H_2O$ system at 20°C.

mass % As_2O_5	mass % ZnO	Solid phase[a]	$C_{As_2O_5}$/mol kg^{-1}[b]	C_{ZnO}/mol kg^{-1}[b]
6.3	1.2	D	0.296	0.159
14.1	3.2	"	0.742	0.475
26.8	3.5	"	1.67	0.617
38.8	3.6	"	2.93	0.768
47.5	3.9	"	4.25	0.986
56.1	2.3	"	5.87	0.679
59.6	2.3	"	6.81	0.742
62.2	2.3	D + E	7.62	0.796
64.0	0.7	E	7.89	0.244
66.3	0.5	"	8.69	0.185
67.6	0.5	"	9.22	0.193
67.8	0	F	9.16	- - -
68.6	0.3	"	9.60	0.119
69.8	0.8	G	10.33	0.334
69.0	0.	H	9.68	- - -
65.4	0.6	I	8.37	0.217

[a] D = $2ZnO \cdot As_2O_5 \cdot 3H_2O$; E = $ZnO \cdot 2As_2O_5 \cdot 8H_2O$; F = $ZnO \cdot 2As_2O_5 \cdot 6H_2O$; G = $ZnO \cdot 2As_2O_5 \cdot 3H_2O$; H = $ZnO \cdot 2As_2O_5 \cdot 1.5H_2O$; I = $ZnO \cdot 2As_2O_5 \cdot 10H_2O$.

[b] The data were converted to mol/kg H_2O by the compiler.