COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium hydroxide; $Cd(OH)_2$; [21041-95-2] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Sodium hydroxide; NaOH; [1310-73-2] (4) Lithium hydroxide; LiOH; [1310-65-2] (5) Water; H_2O; [7732-18-5]	Rozentsveig, S. A.; Ershler, B. V.; Shtrum, E. L.; Ostanina, M. M. *Trudy Soveschaniya Elektrokhim. Akad. Nauk. SSSR, Otdel. Khim. Nauk* 1950, 571-8.
VARIABLES:	PREPARED BY:
Concentration of the alkali hydroxides.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Cd(OH)_2$ in aqueous alkalies

$C_{alkalies}$/mol dm^{-3}	C_{Cd}/mol dm^{-3} in KOH	in NaOH	in LiOH
1	9×10^{-6}	9×10^{-6}	- - - - -
2.5	6×10^{-5}	5×10^{-5}	traces
4	9×10^{-5}	10^{-4}	4.4×10^{-5}
7	1.2×10^{-4}	1.4×10^{-4}	9×10^{-5}
10	1.5×10^{-4}	1.6×10^{-4}	1.21×10^{-4}

No temperature is specified for these results but the results appear to have been obtained at room temperature. The solubility determinations were incidental to the main purpose of the authors, which was to describe the electrochemical behavior of cadmium in these solutions.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The only statement about the procedure is that the analytical results were determined by a polarographic method. Nothing is stated about the method whereby equilibrium was attained or verified.	No information is given.
	ESTIMATED ERROR: No information is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium hydroxide; $Cd(OH)_2$; [21041-95-2] (2) Perchloric acid; $HClO_4$; [7601-90-3] (3) Sodium hydroxide; NaOH; [1310-73-2] (4) Water; H_2O; [7732-18-5]	Gayer, K. H.; Woontner, L. *J. Phys. Chem.* 1957, *61*, 364-5.
VARIABLES: Alkalinity and acidity at 25°C.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Table 1

Solubility of $Cd(OH)_2$ in $HClO_4$ solutions at 25°C.

pH	(Activity of $HClO_4$) x 10^{8a}	(mols Cd/kg H_2O) x 10^4
8.98	(water solubility)	0.15
7.62	2.4	15.1
7.35	4.5	19.5
7.05	8.5	44

[a] presumably the activity is expressed as mol $HClO_4$/kg H_2O.

Table 2

Solubility of $Cd(OH)_2$ in NaOH solutions at 25°C.

(mol OH^- dm^{-3}) x 10^5	(mol Cd^{2+} dm^{-3}) x 10^6
1.00	15.0
1.60	7.9
2.30	7.0
66	3.5
560	3.6
5500	5.9
10100	6.2
2.8×10^{6} [b]	7.5
5.4×10^{4}	8.8
9.0×10^{5}	13.0
1.4×10^{5}	22
1.8×10^{5}	38
2.1×10^{5}	63

[b] this is obviously a misprint in the original article and should be 2.8×10^4.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Duplicates were made of each mixture. One was shaken at 25°C for at least a week and then allowed to settle 3-5 days. The other was shaken at 35°C for at least a week and then allowed to settle at 25°C for 3-5 days. pH determination was made with a pH meter. Cd content was determined colorimetrically as a dithizone complex.	Conductivity water, carbonate-free NaOH, and purified 70% $HClO_4$ were used. $Cd(OH)_2$ was prepared by the slow hydrolysis of a dilute solution of cadmium acetate using reagent grade materials.
	ESTIMATED ERROR: No information is given and apparently only the average results of the duplicate samples are published.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium hydroxide; $Cd(OH)_2$; [21041-95-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Sodium perchlorate; $NaClO_4$; [7601-89-0] (4) Water; H_2O; [7732-18-5]	Ryan, D.E.; Dean, J.R.; Cassidy, R.M. *Can. J. Chem.* 1965, *43*, 999-1003
VARIABLES: OH^- ion concentration at 24.5° and at constant ionic strength	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Table 1

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

Ionic strength = 7 mol dm^{-3}		Ionic strenth = 1 mol dm^{-3}	
mol OH^- dm^{-3}	(mol $Cd(OH)_2$ dm^{-3}) x 10^5	mol OH^- dm^{-3}	(mol $Cd(OH)_2$ dm^{-3}) x 10^5
7.0	16.0	0.93	0.4
6.0	11.0	0.54	0.2
5.0	7.6	0.47	0.1
4.0	4.9	0.26	0.2
3.0	2.5	0.047	0.2
2.0	1.2	6.3×10^{-4}	0.6
1.0	0.5	4.1×10^{-4}	0.8
0.75	0.3	1.7×10^{-4}	2.2
0.10	0.2	6.8×10^{-5}	4.8
0.05	0.2	5.5×10^{-5}	5.5
0.01	0.3		
0.005	0.4		

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

$Cd(OH)_2$ was prepared by dropwise addition of 1.5 M NaOH to a dilute $Cd(NO_3)_2$ solution. The precipitate was washed and allowed to stand in water for 12 hours before being used. Then it was added to the NaOH solutions and the mixture was shaken for 10-14 days. Ionic strength was maintained by adding $NaClO_4$. The analysis for Cd^{2+} was done by measuring the fluorescence when 8-hydroxyquinoline-5-sulfonic acid was added (1). At least 3 replicate samples were used each time.

SOURCE AND PURITY OF MATERIALS:

Double distilled water was used and precautions were taken to exclude carbonate ion and CO_2.

ESTIMATED ERROR:

Solubility values have an uncertainty of $\pm 1 \times 10^{-6}$ mol dm^{-3}.

REFERENCES:

1. Bishop, J.A. *Anal. Chim. Acta* 1963, *29*, 172.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium hydroxide; $Cd(OH)_2$; [21041-95-2] (2) Ammonia; NH_3; [7664-41-7] (3) Sodium perchlorate; $NaClO_4$; [7601-89-0] (4) Water; H_2O; [7732-18-5]	Gubeli, A. O.; Taillon, R. *Helv. Chim. Acta* 1971, *54*, 2559-68.
VARIABLES:	**PREPARED BY:**
Concentration of ammonia at constant ionic strength of 1 mol dm^{-3}.	T. P. Dirkse

EXPERIMENTAL VALUES:

No numerical data are given. Equations are derived for the toal concentration of cadmium and of ammonia in terms of equilibrium constant expressions. Then, using analytical results, a set of equations is solved simultaneously to derive several equilibrium constant values. These calculated constants are then used to calculate a solubility curve of $Cd(OH)_2$ as a function of pH and of ammonia concentration. These calculated curves are then compared to the experimentally determined values.

The calculated results at 25°C are as follows (these are concentration ratios):

$Cd(OH)_2(s) = Cd^{2+} + 2OH^-$	$\log K_{s0} = -14.6$
$Cd^{2+} + OH^- = CdOH^+$	$\log K_{10} = -4.7$
$Cd^{2+} + 2OH^- = Cd(OH)_2(aq)$	$\log K_{20} = -7.8$
$Cd^{2+} + 4OH^- = Cd(OH)_4^{2-}$	$\log K_{40} = -9.7$
$Cd^{2+} + NH_3 = Cd(NH_3)^{2+}$	$\log K_{01} = 3.1$
$Cd^{2+} + 2NH_3 = Cd(NH_3)_2^{2+}$	$\log K_{02} = 5.2$
$Cd^{2+} + 3NH_3 = Cd(NH_3)_3^{2+}$	$\log K_{03} = 6.5$
$Cd^{2+} + 4NH_3 = Cd(NH_3)_4^{2+}$	$\log K_{04} = 7.8$
$Cd^{2+} + 2OH^- + NH_3 = Cd(OH)_2(NH_3)$	$\log K_{21} = 9.85$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

$Cd(OH)_2$ was added to the solutions and agitated for a few days and then allowed to rest for a week. pH was measured with a glass electrode. Cadmium content was measured by EDTA titration or colorimetrically using the method of Saltzman (1). The ionic strength was maintained by adding $NaClO_4$.

SOURCE AND PURITY OF MATERIALS:

The $Cd(OH)_2$ was prepared by adding aqueous NaOH to a solution of $Cd(ClO_4)_2$. Nothing is said about the purity of any of the materials used.

ESTIMATED ERROR:

Nothing is said about temperature control. The calculated equilibrium constants have a standard deviation of ±0.02.

REFERENCES:

1. Saltzman, B. E. *Anal. Chem.* 1953, *25*, 493.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium oxide; CdO; [1306-19-0] (2) 2-Aminoethanol; C_2H_7NO; [141-43-5] (3) 2,2'-Iminodiethanol; $C_4H_{11}NO_2$; [111-42-2] (4) Water, H_2O; [7732-18-5]	Danilov, V. V.,; Martinson, I. G.; Ravdel, A. A. *Zh. Obshch. Khim.* 1974, *44*, 718-21.
VARIABLES: Solution composition and the temperature.	**PREPARED BY:** T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of CdO in the system CdO-2-aminoethanol-water

mol 2-aminoethanol dm^{-3}	mol CdO dm^{-3} 25°C	30°C	40°C	50°C	Solid phase[a]
1.00	0.0042	0.0040	0.0036	0.0033	$Cd(OH)_2$
2.00	0.018	0.017	0.016	0.014	"
3.02	0.039	0.037	0.033	0.031	$Cd(OH)_2 \cdot 2MEA$
4.01	0.066	0.060	0.054	0.052	"
5.35	0.13	0.12	0.11	0.10	"
7.10	0.29	0.28	0.27	0.24	"
11.00	0.62	0.59	0.55	0.50	"

[a]MEA represents 2-aminoethanol

Solubility of CdO in the system CdO-2,2'iminodiethanol-water

mol 2,2'-iminodiethanol dm^{-3}	mol CdO dm^{-3} 25°C	30°C	40°C	50°C	Solid phase
1.20	0.0017	0.0016	0.0014	0.0012	$Cd(OH)_2$
1.51	0.0030	0.0028	0.0024	0.0021	"
2.03	0.0048	0.0044	0.0039	0.0032	"
2.56	0.0071	0.0066	0.0057	0.0048	"
3.00	0.010	0.0093	0.0079	0.0069	"
4.02	0.022	0.020	0.018	0.015	"
5.92	0.095	0.089	0.080	0.069	"
7.80	0.19	0.18	0.17	0.15	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solutions were equilibrated 30 days with intermittent stirring. Equilibrium was approached from both high and low temperatures. The cadmium content was determined by titration with Trilon B at a pH of about 10 using Eriochrome Black T as indicator. The composition of the solid phase was inferred from a calculation of activity products.

SOURCE AND PURITY OF MATERIALS:

No information is given.

ESTIMATED ERROR:

No information is given about the reproducibility of the analyses nor about the temperature control.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium oxide; CdO; [1306-19-0] (2) Carbon dioxide; CO_2; [124-38-9] (3) Sodium chloride; NaCl; [7647-14-5] (4) Water; H_2O; [7732-18-5]	Shlyapnikov, D. S.; Shtern, E. K. *Dokl. Akad. Nauk SSSR* 1975, 225, 428-31; *Russ.*; *Dokl. Acad. Sci. USSR, Earth Sci. Sect. (Engl. transl.)* 1975, 225, 185-8.
VARIABLES: Sodium chloride concentration and pressure of carbon dioxide at 20°C.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of CdO at 20°C and a CO_2 pressure of 50 atm.

g Cd dm^{-3} in H_2O	g Cd dm^{-3} in 4 mol NaCl dm^{-3}	mol CdO dm^{-3} in H_2O	mol CdO dm^{-3} [a] in 4 mol NaCl dm^{-3}
2.8500	4.5140	0.025	0.040

[a] calculated by the compiler.

The solubility of CdO increases linearly with increasing mol NaCl dm^{-3}.

The solubility of CdO is said to increase with increasing temperature but no quantitative data are given.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solution and solid CdO were shaken in an autoclave for 24 hours at the prescribed temperature. CO_2 was introduced as a solid. Metal analysis was done complexiметrically and colorimetrically. No further details are given.	No information is given.
	ESTIMATED ERROR: This cannot be determined from the information given in the article.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Cadmium oxide; CdO; [1306-19-0] (2) Carbon dioxide; CO_2; [124-38-9] (3) Sodium chloride; NaCl; [7647-14-5] (4) Water; H_2O; [7732-18-5]	Shlyapnikov, D. S.; Shtern, E. K. *Dokl. Akad. Nauk SSSR, Ser. Geol.* 1979, *249*, 457-61.
VARIABLES: Pressure of carbon dioxide and concentration of NaCl at 20°C.	**PREPARED BY:** T. Michalowski

EXPERIMENTAL VALUES:

Solubility and composition of solid phases in the system CdO-NaCl-H_2O-CO_2 at 20°C.

P_{CO_2}	starting solution mol NaCl dm^{-3}	filtrate g Cd dm^{-3}	solid residue %Cd	%CO_2	%Cl	solid composition
1 atm	0	0.23	72.1	14.4	---	CdO + $CdCO_3$
"	1	0.88	65.8	24.4	1.5	$CdCO_3$
"	2	1.5	65.4	24.7	2.1	$CdCO_3$
"	4	3.3	66.1	23.5	2.8	$CdCO_3$
50 atm	0	0.4	65.8	24.1	---	$CdCO_3$
"	1	2.7	65.9	22.3	2.6	$CdCO_3$
"	2	5.06	65.8	24.2	2.4	$CdCO_3$
"	4	9.6	64.8	22.8	1.4	$CdCO_3$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solid CdO and solvent are mixed and CO_2 is bubbled through, or the mixture is added to a rocking autoclave and solid CO_2 is added. The analytical methods were; titration with $AgNO_3$ for Cl^-; gas absorption for CO_2; titration with complexing agents for Cd^{2+}. The solid phases were identified by X-ray diffraction diagrams.

SOURCE AND PURITY OF MATERIALS:

The CdO was prepared from reagent grade materials. No information is given about the other materials that were used.

ESTIMATED ERROR:

The article contains no information about control of temperature and pressure nor about the reproducibility of the analytical procedures.

REFERENCES: