COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Jellinek, K.; Gordon, H. Z. *Physik. Chem.* <u>1924</u>, *112*, 207-49.
VARIABLES: Temperatures at 20° and 40°C.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES: Solubility of silver hydroxide.

t/°C	e.m.f./mV[a]	$C_{Ag^+}/mol\ dm^{-3}$ [b]	$C_{OH^-}/mol\ dm^{-3}$ [c]	$C_{Ag^+} \cdot C_{OH^-}$ [b]
20	178.4	1.1×10^{-6}	7.3×10^{-3}	7.8×10^{-9}
20	105.6	6.0×10^{-8}	9.1×10^{-2}	5.4×10^{-9}
21	106.4	6.2×10^{-8}	9.4×10^{-2}	5.8×10^{-9}
21	107.2	6.4×10^{-8}	9.4×10^{-2}	6.0×10^{-9}
40	142	7.4×10^{-7}	2.0×10^{-2}	1.5×10^{-8}
40	143	7.7×10^{-7}	1.6×10^{-2}	1.2×10^{-8}
40	129	4.6×10^{-7}	3.6×10^{-2}	1.7×10^{-8}
40	120	3.3×10^{-7}	3.6×10^{-2}	1.2×10^{-8}
40	102.1	1.7×10^{-7}	8.9×10^{-2}	1.5×10^{-8}

[a] No corrections were made for junction potentials.

[b] These values were all recalculated by the compiler.

[c] The OH^- ion concentration was calculated by assuming that the NaOH was completely dissociated.

The method of calculating the Ag^+ ion concentration is as follows: The e.m.f. of a Ag/0.1 mol dm^{-3} solution of $AgNO_3$ (assumed to be 80% dissociated) vs the calomel electrode was considered to be 0.461 V at 20°C and 0.454 V at 40°C. A comparison of these values with those in the Table above showed that

$$0.461\ (or\ 0.454) - e.m.f. = 0.058\ (or\ 0.062)\ log\ (0.08)/[Ag^+]$$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O was added to a measured amount of aqueous NaOH. The mixture was stirred under a N_2 atmosphere for a predetermined (but unspecified) time. A Ag electrode was then inserted in the solution and its e.m.f. vs a calomel electrode was measured. This e.m.f. was compared with that of a Ag electrode in a 0.1 mol dm^{-3} $AgNO_3$ solution which was assumed to be 80% dissociated.	Care was taken to exclude CO_2 in all procedures and from all reagents. The Ag_2O was prepared by adding dilute aqueous NaOH to dilute aqueous $AgNO_3$. The precipitate was washed ten times with hot water.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Ammonium hydroxide; NH_4OH; [1336-21-6] (3) Water; H_2O; [7732-18-5]	Olmer, L. J. *Bull. Soc. Chim.* 1924, 35, 333-9.

VARIABLES:	PREPARED BY:
Concentration of NH_4OH at room temperature, ∿17°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous NH_3 at room temperature.

C_{NH_3}/mol dm^{-3}	C_{Ag}/mol dm^{-3}	C_{NH_3}/mol dm^{-3}	C_{Ag}/mol dm^{-3}
0.294	0.088	2.353	0.710
0.588	0.181	2.941	0.848
0.882	0.258	3.521	0.986
1.176	0.355	4.049	1.092
1.471	0.456	4.056	1.191
1.765	0.526	5.001	1.304
2.059	0.585	5.469	1.363

The author attempted to carry out the solubility studies at larger concentrations of NH_3, but he encountered explosive mixtures and inaccurate analyses.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A large excess of Ag_2O was added to aqueous NH_4OH. The mixture was agitated for 2 hours and then allowed to settle for 24 hours. The mixture was decanted and the silver content of the liquid phase was determined gravimetrically as AgCl. The ammonia content of the solution was determined by weighing it as NH_4Cl. All determinations were carried out in duplicate.	The Ag_2O was prepared by adding a slight excess of aqueous $Ba(OH)_2$ to a solution of $AgNO_3$. The precipitate was washed with boiling water and dried in a vacuum for several days in the absence of light. Nothing is said about the source or quality of the other components.
	ESTIMATED ERROR:
	No information is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Methylamine; CH_5N; [74-89-5] (3) Water; H_2O; [7732-18-5]	Olmer, L. J. Bull. Soc. Chim. 1924, 35, 333-9.

VARIABLES:	PREPARED BY:
Concentration of methylamine at room temperature, ∿17°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous methylamine.

C_{CH_5N}/mol dm^{-3}	C_{Ag}/mol dm^{-3}
0.440	0.104
1.412	0.340
2.095	0.504
3.279	0.731
3.556	0.759
5.716	0.954
8.230	0.885
9.333	0.658

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Damp Ag_2O was added to solutions of methylamine. The mixtures were shaken intermittently for 24 hours, then decanted. Silver content of the liquid phase was determined gravimetrically as AgCl. The concentration of methylamine was determined gravimetrically as the hydrochloride. All measurements were made in duplicate.	The Ag_2O was prepared by adding a slight excess of aqueous $Ba(OH)_2$ to a solution of $AgNO_3$. The precipitate was washed with boiling water, and dried in a vacuum for several days. The methylamine was purified by treatment with benzaldehyde and HCl.

ESTIMATED ERROR:
No details are given.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Ethanol; C_2H_6O; [64-17-5] (3) Water; H_2O; [7732-18-5]	Klosky, S.; Woo, L. J. Phys. Chem. 1926, 30, 1179-80.

VARIABLES:	PREPARED BY:
Ratio of ethanol to water in the solvent at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in water-ethanol mixtures at 25°C.[a]

$C_{ethanol}$/mass %	C_{Ag_2O}/mg dm^{-3}	$10^5 C_{Ag_2O}$/mol dm^{-3} [b]
0	26.2	11.3
10.95	19.7	8.5
22.92	18.1	7.8
34.30	17.6	7.6
45.70	17.4	7.5
64.00	14.5	6.3
77.00	12.0	5.2
91.50	9.1	3.9

[a] Each value is the average of two determinations.

[b] Calculated by the compiler.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Mixtures of Ag_2O and solvent were contained in bottles placed in a thermostat at 25°C. The mixtures were stirred for about 10 hours, allowed to settle for an hour, and then filtered. A small amount of solution having 0.1 mol KCl dm^{-3} was added to the filtrate and the resulting turbidity was compared with a set of standards to determine the silver content.	The Ag_2O was prepared by treating an aqueous solution of $AgNO_3$ with aqueous NaOH, washing the precipitate by decantation until it was free of sodium ions. The precipitate was then dried over concentrated H_2SO_4 in a desiccator. The ethanol was a 95% mixture that was redistilled twice.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium nitrate; KNO_3; [7757-79-1] (3) Water; H_2O; [7732-18-5]	Laue, E. Z. Anorg. Allg. Chem. 1927, 165, 325-63.

VARIABLES:	PREPARED BY:
Method of measuring the solubility, and the temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Table I. Solubility of Ag_2O in water.[a]

$t/°C$	10^6 sp. cond./Ω^{-1}	$10^4 C_{Ag}$/mol dm^{-3}
18	26.09[b]	1.14
20	28.58[b]	1.20
25	35.48[b]	1.39

[a] Determined from specific conductance measurements. The measured values were corrected according to a table published earlier (2).

[b] Average of two values.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Two methods were used to measure the solubility of Ag_2O. (1) Ag_2O was mixed with water and the mixtures were rotated. The liquid phase was removed and another sample of water was added. This process was repeated 3 times to remove the finely divided particles. The specific conductance of the sample was measured (1) and the solubility determined from this value and literature values for individual ionic conductances (2). (2) Ag_2O-water mixtures were rotated for one hour and then filtered through a glass frit. The Ag content was determined by electrolytic deposition after the solutions had been made ammoniacal.	Conductivity water was used throughout. Ag_2O was prepared by precipitation from aqueous $AgNO_3$ with aqueous $Ba(OH)_2$. The precipitate was washed thoroughly and dried over $CaCl_2$. The KNO_3 was a reagent grade material which was recrystallized twice.

	ESTIMATED ERROR:
	Where several results are given the error appears to be less than 5%.

	REFERENCES:
	1. Bottger, W. Z. Physik. Chem. 1903, 46, 521. 2. Laue, E. Z. Anorg. Allg. Chem. 1927, 165, 305.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium nitrate; KNO_3; [7757-79-1] (3) Water; H_2O; [7732-18-5]	Laue, E. Z. Anorg. Allg. Chem. 1927, 165, 325-63.

EXPERIMENTAL VALUES cont'd:

Table II. Solubility of Ag_2O in water at 25°C.

In a series of determinations in which the dissolved silver content was determined by analysis, the following values were obtained (expressed as mg Ag/100 ml 1.69, 1.74, 1.72, 1.61, 1.52, 1.75, 1.79, 1.52, 1.53, 1.61, 1.64, 1.56, 1.56, 1.61. The average is 1.63 mg Ag/100 ml, or 1.51×10^{-4} mol Ag dm^{-3}. Using a correction for CO_2(2), the author adjusts this to 1.31×10^{-4} mol Ag dm^{-3}.

Table III. Solubility of Ag_2O in KNO_3 solutions at 25°C.[a]

C_{KNO_3}/mol dm^{-3}	C_{Ag}/mg (100 ml)$^{-1}$	$10^4 C_{Ag}$/mol dm^{-3} experimental	corrected[b]
0.01	1.97	1.83	1.60
0.1	2.33	2.16	1.90
0.5	2.55	2.36	2.08
2.0	3.11	2.89	2.82

[a] The Ag content was determined analytically. Each value is the average of 4 to 7 determinations.

[b] Corrected for the presence of CO_2(2).

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Laue, E. Z. Anorg. Allg. Chem. 1927, 165, 325-63.
VARIABLES: Concentration of NaOH at 25°C.	PREPARED BY: T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in NaOH solutions at 25°C.

c_{OH^-}/mol dm^{-3}	c_{Ag} [a]	c_{OH^-}/mol dm^{-3}	c_{Ag} [a]
0.0002	0.99	1.06	1.77
0.0002	0.87	1.06	1.81
		1.06	1.87
0.001	0.13	1.04	1.69
0.001	0.19	1.04	1.84
		1.02	1.60
0.01	0.09	1.02	1.60
0.01	0.11	1.01	1.64
		1.00	1.46
0.10	0.39	1.03	1.73
0.10	0.25	1.03	1.50
		1.04	1.64
0.506	0.95	1.02	1.59
0.506	1.00	1.02	1.73
		1.01	1.40
1.05	1.43	1.01	1.53
1.05	1.49	1.01	1.58
1.05	1.69	1.00	1.51

[a] The concentration of Ag is expressed as mg/100 ml.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The mixtures of Ag_2O and NaOH solution were rotated in a thermostat at 25°C for one hour, and then filtered through a glass frit. The Ag content of the filtrate was determined by electrolytic deposition after the filtrate had been made ammoniacal.	Conductivity water was used. The NaOH solutions were prepared by dilution of a saturated NaOH solution. The Ag_2O was prepared by precipitation from aqueous $AgNO_3$ using aqueous $Ba(OH)_2$. The precipitate was washed thoroughly and dried over $CaCl_2$ in a desiccator.
	ESTIMATED ERROR: No details are given, but the uncertainties appear to be greater than 10%.
	REFERENCES: 1. Laue, E. Z. Anorg. Allg. Chem. 1927, 165, 305.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide, Ag_2O; [20667-12-3] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Laue, E. *Z. Anorg. Allg. Chem.* <u>1927</u>, *165*, 325-63.

EXPERIMENTAL VALUES: (con't)

Solubility of Ag_2O in NaOH solutions at 25°C

C_{OH^-}/mol dm^{-3}	C_{Ag} [a]	C_{OH^-}/mol dm^{-3}	C_{Ag} [a]
2.28	3.10	5.27	4.16
2.28	2.96	5.00	4.51
2.28	3.01	5.07	4.46
2.22	3.12	5.17	4.14
2.22	3.24	5.34	5.07
		5.34	5.10

a
   The concentration of Ag is expressed as mg/100 ml.

Because of the scatter in the above results, the author presents the following summarizing Table.

C_{OH^-}/mol dm^{-3}	$10^4 C_{Ag}$/mol dm^{-3}	$10^4 C_{Ag}$/mol kg^{-1}
0.10	0.30	0.30
0.506	0.91	0.91
1.03	1.50	1.50
2.26	2.86	2.86
5.20	4.23	4.31

The solubility values in the 0.0002 mol dm^{-3} solutions of NaOH were used by the author to arrive at another value for the solubility of Ag_2O in water. Applying corrections he has discussed earlier (1) he arrives at a value of 1.39 x 10^{-4}mol dm^{-3} for the solubility of Ag (from Ag_2O) in water at 25°C.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Ammonium hydroxide; NH_4OH; [1336-21-6] (3) Water; H_2O; [7732-18-5]	Randall, M.; Halford, J. O. *J. Am. Chem. Soc.* 1930, *52*, 178-91.

VARIABLES:	PREPARED BY:
Concentration of ammonium hydroxide at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous NH_4OH at 25°C.

C_{NH_4OH}/mol kg^{-1}	$C_{Ag}+$/mol kg^{-1}	C_{NH_4OH}/mol kg^{-1}	$C_{Ag}+$/mol kg^{-1}
0.05302	0.01155	0.3200	0.07535
0.05532	0.01282	0.3540	0.07787
0.05821	0.01338	0.6519	0.1525
0.06173	0.01406	0.6767	0.1582
0.1479	0.03499	0.6950	0.1623
0.1575	0.03606	0.8673	0.2033
0.2456	0.05787	0.9518	0.2225
0.3155	0.07352	1.2304	0.2888

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The Ag_2O and NH_4OH solutions were mixed and rotated in a thermostat at 25°C for at least 24 hours and then allowed to settle for a few hours. Samples of solution were placed in an excess of HCl and back-titrated with NaOH to determine the NH_4OH content. The silver content was determined by the Volhard method.	The NH_4OH solutions were prepared by dilution of a U.S.P. concentrated NH_4OH solution. The Ag_2O was prepared by adding aqueous $AgNO_3$ to an excess of aqueous Ba(OH)$_2$ The precipitate was washed and heated to boiling in distilled water.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. 1933, 55, 2311-25.
VARIABLES:	PREPARED BY:
Concentration of NaOH at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous NaOH at 25°C.

C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}		C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}	
	U [a]	S [b]		U [a]	S [b]
0.0012	– – –	3.29	0.2112	4.01	4.19
0.0013	2.94	– – –	0.2726	5.23	– – –
0.0023	1.83	– – –	0.3920	7.38	– – –
0.0101	0.76	– – –	0.3990	7.31	– – –
0.0113	0.50	0.58	0.7485	15.0	14.4
0.0124	– – –	0.55	0.7755	14.9	15.7
0.0196	0.62	0.69	1.174	19.3	20.6
0.0223	0.67	0.67	1.276	23.2	21.9
0.0394	0.93	1.01	1.385	24.2	23.1
0.0507	1.01	1.22	1.856	30.7	31.8
0.0566	1.25	1.39	2.330	35.3	38.8
0.0754	1.72	1.80	2.514	34.9	35.0
0.0889	1.83	2.24	2.757	43.6	43.3
0.1174	– – –	2.62	3.219	39.8	41.2
0.1463	3.44	3.50	4.894	47.5	48.3
0.1807	3.62	– – –	6.600	54.0	54.6

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O and NaOH solution were mixed and shaken for 10-18 days in a thermostat and then allowed to sediment for 5-7 days in another thermostat at 25°C. The clear solution was siphoned off under N_2 pressure and forced through a filter (silver, or unglazed porcelain, or porous Jena glass). Silver content was determined by a potentiometric titration with KI. Total alkali was determined by titration with a standard acid. Equilibrium was approached from both undersaturation and supersaturation.	The NaOH solutions were prepared by the reaction of sodium amalgam with conductivity water. Ag_2O was prepared by adding, dropwise and simultaneously, dilute solutions of $AgNO_3$ and of $Ba(OH)_2$ to very hot conductivity water. The precipitate was washed 15 times with conductivity water. The entire process was carried out under a N_2 atmosphere. Conductivity water was used throughout.
	ESTIMATED ERROR: In the majority of the determinations it was well below 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. *J. Am. Chem. Soc.* <u>1933</u>, 55, 2311-25.

VARIABLES:	PREPARED BY:
Concentration of KOH at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous KOH at 25°C.

C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}		C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}	
	u^a	s^b		u^a	s^b
0.0005	10.3	- - -	0.0600	1.51	1.40
0.0008	- - -	4.39	0.0827	1.76	1.78
0.0012	- - -	3.08	0.1225	2.50	2.63
0.0029	1.42	- - -	0.1712	3.48	3.62
0.0093	0.65	- - -	0.4116	7.96	7.96
0.0095	0.63	0.66	0.6708	11.68	12.32
0.0098	0.53	- - -	1.628	25.3	30.0
0.0138	0.58	0.64	2.063	30.8	32.8
0.0205	0.60	0.67	3.006	38.7	- - -
0.0254	0.72	0.76	3.605	41.3	43.8
0.0313	0.90	0.87	5.007	- - -	47.0
0.0457	1.03	1.12	5.238	50.9	47.0

^{a} Equilibrium was approached from undersaturation.

^{b} Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O was added to the solvent and the mixture was shaken for 10-18 days, and then allowed to sediment for 5-7 days in another thermostat at 25°C. The clear solution was siphoned off under N_2 pressure and forced through a porous silver filter. Total alkali concentration was determined by titration with standard acid. The silver content was determined by a potentiometric titration with dilute aqueous KI. Equilibrium was approached from undersaturation and from supersaturation.	The KOH solutions were prepared by the reaction of potassium amalgam with water. Ag_2O was prepared by adding, dropwise and simultaneously, aqueous $AgNO_3$ and aqueous $Ba(OH)_2$ to hot water. The precipitate was washed 15 times with water. The entire process was carried out under a N_2 atmosphere. All the water was conductivity water.
	ESTIMATED ERROR: Less than 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Barium hydroxide; $Ba(OH)_2$; [17194-00-2] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. 1933, 55, 2311-25.

VARIABLES:	PREPARED BY:
Concentration of $Ba(OH)_2$ at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous $Ba(OH)_2$ at 25°C.

C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$ mol dm^{-3}		C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}	
	U[a]	S[b]		U[a]	S[b]
0.0004	17.8	- - -	0.0204	0.67	0.61
0.0007	- - -	7.37	0.0342	0.85	0.87
0.0016	2.43	3.27	0.0413	1.12	1.17
0.0027	1.28	1.24	0.0537	1.36	1.32
0.0076	0.61	- - -	0.0663	1.52	1.51
0.0153	0.65	0.73	0.0939	- - -	2.04
0.0178	0.69	- - -	0.1318	2.81	2.86
0.0191	0.54	0.86	0.1630	3.39	3.66
0.0208	0.69	0.69	0.2946	5.86	6.01

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solid Ag_2O was agitated, in contact with $Ba(OH)_2$ solutions, in a shaking device for 10 to 18 days. The mixtures were allowed to sediment for 5-7 days in another thermostat at 25°C. The clear solution was siphoned off and forced through a porous silver filter under N_2 pressure. Equilibrium was approached from undersaturation and from supersaturation. Total alkalinity was determined by titration with standard acid. Silver content was determined by a potentiometric titration with a dilute KI solution.	Conductivity water was used throughout. $Ba(OH)_2$ was reagent grade material and was recrystallized 5 times. Ag_2O was prepared by adding aqueous $AgNO_3$ and aqueous $Ba(OH)_2$ to hot conductivity water. The precipitate was washed 15 times with water. All these operations were carred out under a N_2 atmosphere.
	ESTIMATED ERROR: Less than 1 %.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium nitrate; KNO_3; [7757-79-1] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. 1933, 55, 2311-25.

VARIABLES:	PREPARED BY:
Concentration of KNO_3 and alkalinity of the solution at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in alkaline KNO_3 solutions at 25°C.

c_{KNO_3}/mol dm^{-3}	c_{OH^-}/mol dm^{-3}	$10^5 c_{Ag}$/mol dm^{-3}	
		U [a]	S [b]
0.0120	0.0382	0.98	1.09
0.0302	0.0338	0.98	0.84
0.0524	0.0410	1.22	1.00
0.0690	0.0471	1.33	1.47
0.0855	0.0413	1.20	1.10
0.104	0.0387	1.08	1.15
0.254	0.0638	1.64	1.79
0.300	0.0358	1.01	0.98
0.415	0.0376	0.93	1.06
0.641	0.0641	1.55	1.58
1.02	0.0367	1.04	1.03
1.34	0.0648	1.32	1.36
1.43	0.0589	1.58	1.69
1.85	0.0461	1.16	1.06
2.07	0.0644	1.45	1.39
2.46	0.0578	1.72	1.72
3.01	0.0469	1.10	1.14
3.15	0.0567	1.31	1.31
3.46	0.0451	1.16	1.23
3.71	0.0518	1.19	1.22
3.88	0.0521	1.22	1.34

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O and solvent were mixed in a shaking device and shaken 10-18 days in a thermostat. After settling for 5-7 days in another thermostat at 25°C, the clear liquid was siphoned off and forced through a filter of unglazed porcelain or of porous Jena glass. All this was done under a N_2 pressure. Total alkalinity was determined by titration with a standard acid. The silver content was determined by a potentiometric titration with KI. No information is given about the substance that was used to make the solutions alkaline.	Conductivity water was used throughout. The KNO_3 was a reagent grade material and was recrystallized twice. Ag_2O was produced by adding $AgNO_3$ and $Ba(OH)_2$ to very hot water and then washing the precipitate 15 times with water. All this was done in a N_2 atmosphere.
	ESTIMATED ERROR: Less than 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium sulfate; K_2SO_4; [7778-80-5] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. <u>1933</u>, 55, 2311-25.

VARIABLES:	PREPARED BY:
Alkalinity of solution and concentration of K_2SO_4 at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in alkaline K_2SO_4 solutions at 25°C.

$C_{K_2SO_4}$/equiv dm^{-3}	C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}	
		u[a]	s[b]
0.0019	0.0492	1.16	1.10
0.0049	0.0406	1.05	1.03
0.0090	0.0407	1.13	1.23
0.0351	0.0434	1.17	1.30
0.0553	0.0414	1.05	1.10
0.0795	0.0392	1.18	1.04
0.1010	0.0554	1.23	1.47
0.1178	0.0392	1.07	1.07

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O and solvent were mixed in a shaking device and shaken 10 to 18 days in a thermostat. After sedimenting for 5 to 7 days in another thermostat at 25°C, the clear liquid was siphoned off under N_2 pressure and forced through a filter of unglazed porcelain or of porous Jena glass. Total alkalinity was determined by titration with standard acid. Silver content was determined by potentiometric titration with dilute aqueous KI. Nothing is stated about what substance was used to make the K_2SO_4 solutions alkaline.	The K_2SO_4 was a reagent grade material that was recrystallized twice from conductivity water. Ag_2O was produced by adding dilute aqueous $AgNO_3$ and dilute aqueous $Ba(OH)_2$ simultaneously to hot water and washing the precipitate 15 times. All this was done under a N_2 atmosphere. Conductivity water was used throughout.
	ESTIMATED ERROR: Less than 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Barium nitrate; $Ba(NO_3)_2$; [10022-31-8] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. 1933, 55, 2311-25.
VARIABLES:	PREPARED BY:
Concentration of barium nitrate at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in alkaline $Ba(NO_3)_2$ solutions at 25°C.

$C_{Ba(NO_3)_2}$/equiv dm^{-3}	C_{OH^-}/mol dm^{-3}	$10^5 C_{Ag}$/mol dm^{-3}	
		U [a]	S [b]
0.0011	0.0342	0.85	0.93
0.0016	0.0309	0.78	0.91
0.0033	0.0328	0.85	1.01
0.0051	0.0278	0.94	0.91
0.0087	0.0354	0.98	1.08
0.0254	0.0358	1.01	1.03
0.0607	0.0325	0.90	0.96
0.0851	0.0422	1.07	1.13
0.1749	0.0451	1.14	1.19
0.2871	0.0440	1.23	1.24

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ag_2O and solvent were shaken together in a mixing device in a thermostat for 10-18 days. After settling for 5-7 days in another thermostat at 25°C, the clear liquid was siphoned off and forced through a filter of unglazed porcelain or porous Jena glass. This was all done under a pressure of N_2. Total alkalinity was determined by titration with a standard acid. The silver content was measured by a potentiometric titration with KI. Equilibrium was approached both from undersaturation and from supersaturation. There is no information as to how the solutions were made alkaline.	Ag_2O was prepared by dropping dilute aqueous $AgNO_3$ and dilute aqueous $Ba(OH)_2$ simultaneously into hot water. Under a N_2 atmosphere the precipitate was washed 15 times. Conductivity water was used throughout. The $Ba(NO_3)_2$ was reagent grade material and was recrystallized twice from water.
	ESTIMATED ERROR: Well below 1%.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Chromium(VI) oxide; [1333-82-0] (3) Water; H_2O; [7732-18-5]	Campbell, A. N.; Lemaire, H. P. *Can. J. Research* 1947, *25B*, 243-54.

VARIABLES:	PREPARED BY:
Concentration of CrO_3 at 30°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous CrO_3 at 30°C.

c_{Ag_2O}/mass%	c_{CrO_3}/mass%	$10^3 c_{Ag_2O}$/mol kg^{-1} [a]	c_{CrO_3}/mol kg^{-1} [a]	Solid phase [b]
0.09	0.21	3.90	0.021	A + B
0.08	0.21	3.46	0.021	"
0.11	0.19	4.76	0.019	"
0.10	0.18	4.33	0.018	"
0.07	0.34	3.03	0.034	B
0.08	2.55	3.55	0.262	"
0.1	4.07	4.50	0.425	"
0.1	7.11	4.65	0.766	"
0.1	8.11	4.70	0.884	"
0.1	15.4	5.11	1.82	"
0.1	24.0	5.69	3.16	"
0.1	35.1	6.66	5.42	"
0.1	46.9	8.16	8.89	"
0.1	53.5	9.30	11.5	"
0.1	58.5	10.4	14.1	"
0.1	61.9	11.4	16.3	C + D
0.1	61.9	11.4	16.3	"

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

[b] The solid phases are: A = Ag_2CrO_4; B = solid solution; C = $Ag_2Cr_2O_7$; D = CrO_3.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Increasing quantities of CrO_3 were added to 10 g of moist Ag_2O suspended in 100 ml of water. The mixtures were stirred constantly in a constant temperature bath and the conductance of the solutions was measured daily to ensure attainment of equilibrium. The mixtures were then filtered. The silver content was determined by the Volhard method. The chromate ion concentration was measured by adding excess $FeSO_4$ and back-titrating with $KMnO_4$.	Ag_2O was prepared by the addition of a dilute solution of NaOH to aqueous $AgNO_3$. The precipitate was washed several times with hot and cold water and placed in a desiccator. The CrO_3 was a commercial product with a purity of 99.87%. Twice-distilled water was used.
	ESTIMATED ERROR: Nothing is stated except that the temperature was controlled to within 0.03°C.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) 2-Aminoethanol (*ethanolamine*); C_2H_7NO; [141-43-5] (3) Water; H_2O; [7732-18-5]	Alner, D. J.; Smeeth, A. G. *J. Chem. Soc.* <u>1958</u>, 4207-10.

VARIABLES:	PREPARED BY:
Concentration of 2-Aminoethanol at 20°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous MEA[a] at 20°C.

$10^2 c_{MEA}$/equiv dm^{-3}	$10^2 c_{Ag_2O}$/equiv dm^{-3}	pH
5.1	1.1	11.98
10.2	2.25	12.31
15.3	3.45	12.48
20.4	4.67	12.55
22.5	5.86	12.61

[a] MEA is the 2-Aminoethanol

The authors use the above information to evaluate the stability constant of the $Ag(MEA)_2^+$ complex. This calculation is based on the following assumptions: (a) $[Ag(MEA)_2^+] = [OH^-]$; (b) the excess MEA is unionized and therefore has an activity coefficient of unity; (c) only one Ag-MEA complex is formed to any significant extent; (d) the activity of the Ag^+ ion can be calculated from the K_s^o for AgOH, i.e., 1.413 x 10^{-8} at 20°C. With these assumptions, the value of the stability constant is expressed as log β_2 = 6.91.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Moist Ag_2O was added to solutions of 2-Aminoethanol of known concentration, and shaken mechanically (for an unspecified time) in black bottles at 20°C until equilibrium was reached. The pH of the solution was determined with a glass electrode. The silver content of the solution was determined by the Volhard titration method.	The Ag_2O was prepared by adding the stoichiometric amount of NaOH to a dilute solution of $AgNO_3$. The precipitate was washed with hot water until free of electrolytes, and then filtered. The 2-Aminoethanol was purified by distilling it under reduced pressure.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) 2,2'-iminodiethanol (*diethanolamine*); $C_4H_{11}NO_2$; [111-42-2] (3) Water; H_2O; [7732-18-5]	Alner, D. J.; Smeeth, A. G. *J. Chem. Soc.* <u>1958</u>, 4207-10.

VARIABLES:	PREPARED BY:
Concentration of the 2,2'-iminodiethanol at 20°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous DEA [a] at 20°C.

$10^2 c_{DEA}$/equiv dm^{-3}	$10^3 c_{Ag_2O}$/equiv dm^{-3}	pH
5.0	4.2	11.72
10.0	8.6	11.98
15.0	13.2	12.12
20.0	17.8	12.23
25.0	22.4	12.31

[a] DEA is the 2,2'-iminodiethanol.

The authors used the above data to report the stability constant of
$Ag(DEA)_2^+$. The result was reported as log β_2 = 5.80. This was based
on the following assumptions: (a) only one complex is formed, i.e.,
$Ag(DEA)_2^+$; (b) the activity of the complex is equal to the activity
of the OH^- ion; (c) the excess DEA is unionized and therefore has
an activity coefficient of unity; (d) K_s^0 for AgOH is 1.413 x 10^{-8}
at 20°C; (e) the activity coefficients of univalent ions was
calculated from the relationship:

$$-\log f = 0.505 \sqrt{I}/(1 + \sqrt{I})$$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Excess moist Ag_2O was added to solutions of 2,2'-iminodiethanol of known concentration, and the mixture was shaken mechanically in black bottles at 20°C until equilibrium was reached. The pH of the solutions was measured with a glass electrode. The silver content of the clear filtrate was determined by the Volhard method.	The 2,2'-iminodiethanol was purified by distillation under reduced pressure. The Ag_2O was prepared by adding a stoichio- metric amount of NaOH to a dilute solution of $AgNO_3$. The precipitate was washed with hot water until free of electrolytes, and then filtered.
	ESTIMATED ERROR: No indication is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) 2,2',2"-Nitrilotriethanol (*triethanola-mine*); $C_6H_{15}NO_3$; [120-71-6] (3) Water; H_2O; [7732-18-5]	Alner, D. J.; Smeeth, A. G. *J. Chem. Soc.* <u>1958</u>, 4207-10.

VARIABLES:	PREPARED BY:
Concentration of 2,2',2"-nitrilotriethanol at 20°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in aqueous TEA[a] at 20°C.

$10^2 c_{TEA}$/equiv dm^{-3}	$10^3 c_{Ag_2O}$/equiv dm^{-3}	pH
10.1	1.6	11.35
15.2	2.4	11.53
20.2	3.2	11.64
25.3	4.0	11.73

[a] TEA is the 2,2',2"-nitrilotriethanol.

The authors used these data to evaluate the stability constant of $Ag(TEA)_2^+$. The result was reported as $\log\beta_2 = 4.23$. This result is based on the following assumptions:

1- only one complex is formed, i.e., $Ag(TEA)_2^+$;

2- the activity of this complex is equal to the activity of OH$^-$ ion in the solution;

3- the excess TEA is unionized and therefore has an activity coefficient = 1;

4- K_{s0}^o for AgOH = 1.413×10^{-8} at 20°C;

5- the activity coefficients of the univalent ions was calculated from the relationship: $-\log f = 0.505\sqrt{I}/(1 + \sqrt{I})$.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Excess moist Ag_2O was added to solutions of the 2,2',2"-nitrilotriethanol and the mixtures were shaken mechanically in black bottles at 20°C until equilibrium was attained. The pH of the solutions was measured with a glass electrode. The silver content of the clear filtrate was determined by a Volhard titration.	Ag_2O was prepared by adding a stoichiometric amount of NaOH to a dilute solution of $AgNO_3$. The precipitate was washed with hot water until it was free of electrolytes, and then filtered. The 2,2',2"-nitrilotriethanol was purified by distillation under a reduced pressure. The resulting material had a purity of 99.7%.
	ESTIMATED ERROR: No details are given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Nasanen, R.; Merilainen, P. *Suomen Kemistilehti* 1960, *33B*, 197-9.

VARIABLES:	PREPARED BY:
Ionic strength of the solution at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Table I. Solubility product of Ag_2O at 25°C.
Mean ionic strength is 0.00865 mol dm^{-3}.

10^3C_{Ag}/mol dm^{-3} [a]	$10^3C_{OH^-}$/mol dm^{-3} [a]	pH	log K
8.77	3.51	8.609	6.297
8.70	4.35	8.683	6.288
8.62	5.17	8.785	6.290
8.55	5.98	8.910	6.287
8.47	6.78	9.086	6.281

Table II. Solubility product of Ag_2O at 25°C.
Mean ionic strength is 0.0182 mol dm^{-3}.

10^3C_{Ag}/mol dm^{-3} [a]	$10^3C_{OH^-}$/mol dm^{-3} [a]	pH	log K
18.9	5.66	8.186	6.307
18.5	7.41	8.265	6.311
18.2	9.09	8.343	6.302
17.9	10.71	8.451	6.305
17.5	12.28	8.576	6.297

[a] These are the total concentrations of $AgNO_3$ and NaOH that were added.

AUXILIARY INFORMATION	

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Varying amounts of a solution of NaOH were added to a constant amount of $AgNO_3$, but in all cases the molar ratio of NaOH:$AgNO_3$ was less than one. Sometimes KNO_3 or $NaClO_4$ were added to modify the ionic strength of the solution. The sample bottles were filled in a N_2 atmosphere. After a standing period of several days, the pH of the solution was measured with a glass electrode. The concentration of the Ag^+ ion was calculated as the difference between the total concentrations of $AgNO_3$ and NaOH. $K = C_{Ag^+}/C_{H^+}$ was calculated for the following reaction: $1/2Ag_2O(s) + H^+ = Ag^+ + 1/2H_2O$.	Nothing is stated about this.

ESTIMATED ERROR:

The log K values are considered accurate to within 0.01 logarithmic unit.

REFERENCES:

1. Nasanen, R.; Merilainen, P. *Suomen Kemistilehti* 1960, *33B*, 149.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3]	Nasanen, R., Merilainen, P. *Suomen*
(2) Sodium hydroxide; NaOH; [1310-73-2]	*Kemistilehti* 1960, 33B, 197-9.
(3) Water, H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd:

Table III. Solubility product of Ag_2O in KNO_3 solutions at 25°C.

I/mol dm^{-3}	log K	pK_w [a]	pK_so
0.0087	6.29	13.91	7.62
0.0182	6.30	13.88	7.58
0.262	6.36	13.73	7.37
1.010	6.55	13.73	7.18
2.000	6.73	13.88	7.15

Table IV. Solubility product of Ag_2O in $NaClO_4$ solutions at 25°C.

I/mol dm^{-3}	pK_w [a]	pK_so
0.260	13.73	7.37
1.000	13.77	7.29
3.000	14.17	7.45

[a] These values were taken from earlier work by these authors (1).

The authors derive the following equation from their data:

$$\log K = 6.29 + 0.28I - 0.031I^2.$$

From this equation and from the fact that $K_so = K \cdot K_w$ they arrive at $pK_s^oo = 7.71$ (I = 0, 25°C).

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Potassium hydroxide; KOH; [1310-58-3] (3) Water; H_2O; [7732-18-5]	Dirkse, T. P.; Vander Lugt, L. A.; Schnyders, H. J. Inorg. Nucl. Chem. 1963, 25, 859-65.

VARIABLES:	PREPARED BY:
Temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of Ag_2O in 1 mol KOH dm^{-3}

$10^4 C_{Ag_2O}$/mol dm^{-3}

$t/°C$	after 1 hour	after 1 week
5	1.19	0.9
27	2.17	1.7

The decrease in solubility with time is explained in terms of a reaction of Ag_2O with the aqueous KOH resulting in the formation of a soluble intermediate, $Ag(OH)_2^-$.

In another series of tests the solubility of Ag_2O in 1 mol KOH dm^{-3} at 22°C was measured over a period of 10 weeks. These results are presented only in graphical form. They show that the solubility decreases when the solutions are exposed to daylight. When the solutions are kept in the dark, the solubility of Ag_2O remains constant if excess solid oxide is present but decreases with time if no excess solid oxide is present. The reactions responsible for this are considered to be:

$$Ag_2O + 2OH^- + H_2O = 2Ag(OH)_2^-$$

$$2Ag(OH)_2^- = 2Ag = 1/2\ O_2 + H_2O + 2OH^-.$$

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Equilibrium was approached isothermally with continuous stirring of the mixtures. Before analysis, the mixtures were filtered through a fine pore Pyrex glass frit. Silver content was determined by a potentiometric titration with KI (1).	Ag_2O was a commercially available product. The KOH was carbonate-free. Distilled water was used as solvent.
	ESTIMATED ERROR: No details are given.
	REFERENCES: 1. Johnston, H. L.; Cuta, F.; Garrett, A. B. J. Am. Chem. Soc. 1933, 55, 2311.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Boron(III) oxide; B_2O_3; [1303-86-2] (3) Water; H_2O; [7732-18-5]	Sadeghi, N. *Ann. Chim.* <u>1967</u>, *2*, 123-31.
VARIABLES:	PREPARED BY:
Concentration of B_2O_3 in the temperature range 0 to 100°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Table I.   Composition of the Ag_2O-B_2O_3-H_2O system at 30°C.

C_{Ag_2O}/mass %	$C_{B_2O_3}$/mass %	C_{Ag_2O}/mol kg^{-1} [a]	$C_{B_2O_3}$/mol kg^{-1} [a]	Solid phase [b]
0	3.50	0	0.521	A
0.10	3.64	0.0045	0.543	"
0.32	3.77	0.0144	0.565	"
0.55	4.00	0.025	0.602	"
0.81	4.40	0.037	0.667	A + B
0.80	4.33	0.036	0.656	B
0.70	3.70	0.032	0.556	"
0.56	2.80	0.025	0.416	"
0.50	2.40	0.022	0.355	"
0.46	2.22	0.020	0.328	"
0.41	1.80	0.018	0.264	"
0.30	1.0	0.013	0.146	"
0.17	0.30	0.0074	0.043	B + C
0.10	0.15	0.0043	0.022	C
0.0027	0	0.00012	0	"

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

[b] The solid phases are: A = H_3BO_3;   B = $Ag_2O \cdot 2B_2O_3 \cdot 2H_2O$;   C = Ag_2O.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The method is described only as a classical method. Borax was used to provide the B_2O_3 in the solutions. The silver content was determined by the Volhard method. The boric acid content was determined by titration with NaOH. The composition of the solid phases was determined by the Schreinemakers wet-residue method and by x-ray diffraction.	All materials were of reagent grade quality. The Ag_2O was prepared by adding a solution of $Ba(OH)_2$ to a solution of $AgNO_3$.
	ESTIMATED ERROR:
	No information is given.
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O: [20667-12-3]	Sadeghi, N. Ann, Chim. 1967, 2, 123-31
(2) Boron(III) oxide; B_2O_3; [1303-86-2]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd:

Table II. Composition of the Ag_2O-B_2O_3-H_2O system at 56°C.

C_{Ag_2O}/mass %	$C_{B_2O_3}$/mass %	C_{Ag_2O}/mol kg^{-1} [a]	$C_{B_2O_3}$/mol kg^{-1} [a]	Solid phase [b]
0	6.65	0	1.023	A
0.2	6.78	0.009	1.047	"
0.4	6.83	0.02	1.057	"
0.63	6.95	0.029	1.080	"
0.67	7.05	0.031	1.097	"
0.90	7.15	0.042	1.117	"
1.00	7.30	0.0471	1.143	"
1.12	7.40	0.0528	1.162	"
1.20	7.50	0.0567	1.180	"
1.40	7.75	0.0665	1.225	"
1.50	7.80	0.0714	1.235	A + D
1.57	7.90	0.0748	1.253	A[c]
1.70	8.20	0.0814	1.307	A[c]+ B[c]
1.70	7.90	0.0811	1.255	B[c]
1.60	7.70	0.0761	1.219	"
1.55	7.40	0.0735	1.167	"
1.50	7.30	0.0710	1.150	"
1.45	7.60	0.0688	1.200	D
1.43	7.40	0.0677	1.166	"
1.40	7.14	0.0661	1.121	"
1.40	6.85	0.0658	1.072	D + B
1.32	6.60	0.0619	1.030	B
1.2	6.1	0.056	0.95	"
1.15	5.75	0.0533	0.887	"
1.08	5.45	0.0499	0.838	"
0.96	4.50	0.044	0.684	"
0.88	4.50	0.040	0.683	"
0.84	4.30	0.038	0.651	"
0.82	4.10	0.037	0.619	"
0.75	3.80	0.034	0.572	"
0.72	3.50	0.032	0.525	"
0.63	3.10	0.028	0.463	"
0.57	2.60	0.025	0.386	"
0.50	2.10	0.022	0.310	"
0.46	1.90	0.020	0.280	"
0.43	1.60	0.019	0.235	"
0.37	1.35	0.016	0.197	"
0.34	1.05	0.015	0.153	"
0.30	0.90	0.013	0.131	"
0.27	0.60	0.012	0.087	"
0.25	0.50	0.011	0.072	B + C
0.20	0.42	0.0087	0.061	C
0.15	0.22	0.0065	0.032	"
0.0047	0	0.00020	0	"

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

[b] The solid phases are: A = H_3BO_3; B = $Ag_2O \cdot 2B_2O_3 \cdot 2H_2O$; C = Ag_2O; D = $2Ag_2O \cdot 5B_2O_3 \cdot 5H_2O$.

[c] These solid phases are metastable.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3]	Sadeghi, N. *Ann. Chim.* <u>1967</u>, 2, 123-31
(2) Boron(III) oxide; B_2O_3; [1303-86-2]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd:

Table III. Composition of the Ag_2O-B_2O_3-H_2O system at 78°C.

C_{Ag_2O}/mass %	$C_{B_2O_3}$/mass %	C_{Ag_2O}/mol kg^{-1} [a]	$C_{B_2O_3}$/mol kg^{-1} [a]	Solid phase [b]
0	10.80	0	1.739	A
1.20	11.70	0.0595	1.929	"
2.55	13.20	0.131	2.250	A + D
2.95	13.55	0.152	2.331	A[c]
3.50	14.50	0.184	2.540	A[c]+ B[c]
2.50	10.80	0.124	1.789	B[c]
2.50	12.95	0.128	2.200	D
1.70	9.25	0.0824	1.492	"
1.25	5.60	0.0579	0.864	B + D
0.70	2.85	0.031	0.424	B
0.43	1.20	0.019	0.175	B + C
0.20	0.55	0.0087	0.080	C
0.019	0	0.00082	0	"

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

[b] The solid phases are: A = H_3BO_3; B = $Ag_2O \cdot 2B_2O_3 \cdot 2H_2O$; C = Ag_2O; D = $2Ag_2O \cdot 5B_2O_3 \cdot 5H_2O$.

[c] These solid phases are metastable.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3]	Sadeghi, N. *Ann. Chim.* 1967, 2, 123-31
(2) Boron(III) oxide; B_2O_3; [1303-86-2]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES, contd:

Table IV. Composition of the $Ag_2O-B_2O_3-H_2O$ system at 100°C.

C_{Ag_2O}/mass %	$C_{B_2O_3}$/mass %	C_{Ag_2O}/mol kg^{-1} [a]	$C_{B_2O_3}$/mol kg^{-1} [a]	Solid phase [b]
0	16.10	0	2.756	A
0.8	16.60	0.04	2.887	"
1.80	17.10	0.096	3.029	"
2.00	17.60	0.107	3.144	"
2.25	18.00	0.122	3.242	"
3.35	19.80	0.188	3.701	"
3.70	20.40	0.210	3.861	"
3.90	20.80	0.223	3.968	"
4.40	21.60	0.257	4.193	"
4.50	21.80	0.263	4.249	"
4.90	22.20	0.290	4.374	A + D
4.60	21.40	0.268	4.154	D
4.50	21.20	0.261	4.098	"
4.40	20.80	0.254	3.994	"
4.40	20.60	0.253	3.945	"
4.20	20.00	0.239	3.790	"
4.00	19.50	0.226	3.661	"
3.90	19.00	0.218	3.540	"
3.60	17.90	0.198	3.275	"
3.30	16.80	0.178	3.020	"
3.15	16.40	0.169	2.928	"
3.00	15.60	0.159	2.753	"
2.95	15.25	0.156	2.678	"
2.65	13.95	0.137	2.403	"
2.50	13.30	0.128	2.269	"
2.30	12.00	0.116	2.011	"
2.05	11.16	0.102	1.847	"
1.92	10.50	0.095	1.722	"
1.95	10.05	0.096	1.640	"
1.60	8.30	0.077	1.323	"
1.30	6.60	0.061	1.029	"
1.20	6.00	0.058	0.929	"
1.10	5.40	0.051	0.830	"
0.88	4.00	0.040	0.604	"
0.90	3.70	0.041	0.557	B + D
0.80	3.30	0.036	0.494	B
0.70	2.80	0.031	0.417	"
0.66	2.80	0.030	0.417	"
0.55	2.13	0.024	0.314	"
0.57	1.80	0.025	0.265	B + C
0.50	1.60	0.022	0.235	C
0.40	1.40	0.018	0.205	"
0.37	1.20	0.016	0.175	"
0.25	0.90	0.011	0.131	"
0.17	0.60	0.0074	0.087	"
0.044	0	0.0019	0	"

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

[b] The solid phases are: A = H_3BO_3; B = $Ag_2O \cdot 2B_2O_3 \cdot 2H_2O$; C = Ag_2O; D = $2Ag_2O \cdot 5B_2O_3 \cdot 5H_2O$.

Isotherms for the $Ag_2O-B_2O_3-H_2O$ system were also determined at 0 and 18°C. The results at these temperatures are given only in graphical form. The data at 0°C are considered to be rather imprecise because of the small values involved.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Silver(I) oxide; Ag_2O; [20667-12-3] (2) Selenium(IV) oxide; SeO_2; [7446-08-4] (3) Water; H_2O; [7732-18-5]	Ojkova, T.; Gospodinov, G. Z. Anorg. Allg. Chem. 1982, 484, 235-40.

VARIABLES:	PREPARED BY:
Concentration of SeO_2 at 100°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility isotherm of the Ag_2O-SeO_2-H_2O system at 100°C. [a]

C_{Ag_2O}/mass %	C_{SeO_2}/mass %	C_{Ag_2O}/mol kg^{-1} [b]	C_{SeO_2}/mol kg^{-1} [b]	Solid phase
0.14	0.77	0.0061	0.070	Ag_2SeO_3
0.16	2.69	0.0071	0.250	"
0.18	6.13	0.0083	0.590	"
0.19	14.42	0.0096	1.52	"
0.20	19.63	0.011	2.21	"
0.23	29.91	0.014	3.86	"
0.25	34.00	0.016	4.66	"
0.26	39.29	0.019	5.86	"
0.27	48.97	0.023	8.69	"
0.43	52.10	0.039	9.89	"
0.40	56.82	0.040	11.97	"
0.66	62.93	0.078	15.58	"
0.68	63.07	0.081	15.68	"
2.2	69.87	0.34	22.6	- - -

[a] These data were not given in the paper but were kindly supplied in a personal communication from Dr. G. G. Gospodinov.

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

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
One gram of Ag_2O was added to 50 ml of a solution of SeO_2 in H_2O. The mixture was stirred for 24 hours. The glass ampule was then sealed and kept in a thermostat at 100°C for 30 days. The solid and liquid phases were separated from each other by filtration. Silver content was determined by titration with NH_4CNS. The selenium content was determined by iodometric titration.	The SeO_2 was freshly prepared and purified by sublimation. No information is given about the source of Ag_2O or the water.

ESTIMATED ERROR:
No details are given.

REFERENCES: