COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Gold(III) hydroxide; $Au(OH)_3$; [1303-52-2]	Jirsa, F.; Jelinek, H. Z. *Elektrochem.* 1924, *30*, 286-9.
(2) Sulfuric acid; H_2SO_4; [7664-93-9]	
(3) Water; H_2O; [7732-18-5]	
VARIABLES:	**PREPARED BY:**
The concentration of sulfuric acid and the temperature.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Au(OH)_3$ in aqueous H_2SO_4.

Duration of shaking/hours	$C_{H_2SO_4}$/equiv dm^{-3}	C_{Au}/mol dm^{-3}	t/°C
24	20.7	0.0928	29.7
48	20.7	0.0936	"
160	20.7	0.0920	"
18	14.0	0.0128	"
48	10.1	0.0026	"
144	10.1	0.0021	"
210	18.71	0.0629	19.0
408	18.58	0.0627	"
600	18.74	0.0632	"
744	18.60	0.0624	"
912	18.79	0.0632	"

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solid $Au(OH)_3$ was dissolved in hot concentrated H_2SO_4. Water and acid were added to this solution to precipitate $Au(OH)_3$ by hydrolytic action. The mixture was shaken for some time in sealed tubes, and then filtered. The acid content of the filtrate was determined by titration. The gold content was determined gravimetrically by reducing the dissolved gold with formaldehyde. The mixture was heated for some time after the addition of the formaldehyde.

SOURCE AND PURITY OF MATERIALS:

The $Au(OH)_3$ was prepared by treating a gold electrode anodically in a dilute H_2SO_4 solution. The $Au(OH)_3$ precipitated at the electrode. No information is given about any of the other materials that were used.

ESTIMATED ERROR:

No details are given but duplicate results agree to within 5%.

REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Gold(III) hydroxide; $Au(OH)_3$; [1303-52-2]	Jirsa, F.; Jelinek, H. Z. *Elektrochem.* 1924, *30*, 286-9.
(2) Sulfuric acid; H_2SO_4; [7664-93-9]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES contd:

Solubility of $Au(OH)_3$ in aqueous H_2SO_4 at 18.0°C.

Duration of shaking/hours	$C_{H_2SO_4}$/equiv dm^{-3}	C_{Au}/mol dm^{-3}
24	1.57	0.00013
24	1.59	0.00011
48	1.46	0.000081
144	1.01	0.000039
150	1.01	0.000043
192	1.01	0.000039
410	1.01	0.000042
280	0.89	0.000032
432	0.89	0.000039
624	0.89	0.000035
768	0.89	0.000036
144	0.54	0.000031
552	0.53	0.000015
600	0.53	0.000015
624	0.53	0.000018

Compiler's comment: This article is the same as the following:

Jirsa, F.; Jelinek, J. *Chem. Listy* 1924, *18*, 1-4.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Gold(III) hydroxide; $Au(OH)_3$; [1303-52-2] (2) Sodium hydroxide; NaOH; [1310-73-2] (3) Water; H_2O; [7732-18-5]	Johnston, H. L.; Leland, H. L. *J. Am. Chem. Soc.* 1938, *60*, 1439-45.
VARIABLES:	**PREPARED BY:**
Concentration of sodium hydroxide at 25°C.	T. P. Dirkse

EXPERIMENTAL VALUES:

Solubility of $Au(OH)_3$ in H_2O at 25°C.

C_{Au}/mol kg^{-1}	
U [a]	S [b]
0.034×10^{-4}	0.032×10^{-4}
0.028×10^{-4}	0.037×10^{-4}
0.026×10^{-4}	0.030×10^{-4}

average = 0.031×10^{-4}

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solid $Au(OH)_3$ and solvent were mixed and shaken in a constant temperature bath at 25 ± 0.01°C for at least 3 weeks, then allowed to sediment for 2-10 days. Clear solution was removed by decantation and passed through a sintered Jena glass filter. Other mixtures were shaken for 4 days at 40°C and then transferred to the 25°C bath and treated as above. Alkali content was determined by titration with H_2SO_4. Gold content was determined by potentiometric titration with $FeSO_4$ in an atmosphere of N_2.

SOURCE AND PURITY OF MATERIALS:

$Au(OH)_3$ was produced by a method described by others (1) and washed thoroughly. The NaOH solutions were prepared from pure amalgams. Conductivity water was used throughout. All other materials were of reagent grade quality.

ESTIMATED ERROR:

No estimate is given.

REFERENCES:

1. Roseveare, W. E.; Buehrer, T. F. *J. Am. Chem. Soc.* 1927, *49*, 1989.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Gold(III) hydroxide; $Au(OH)_3$; [1303-52-2]	Johnston, H. L.; Leland, H. L. *J. Am. Chem. Soc.* 1938, *60*, 1439-45.
(2) Sodium hydroxide; NaOH; [1310-73-2]	
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES contd:

Solubility of $Au(OH)_3$ in aqueous NaOH at 25°C.

C_{NaOH}/mol kg^{-1}	$10^4 C_{Au}$/mol kg^{-1} U [a]	S [b]
0.0683	- - -	0.73
0.0752	0.89	0.85
0.0939	0.97	1.00
0.0968	- - -	1.51
0.1005	1.01	1.00
0.1100	1.13	1.09
0.1507	2.01	2.00
0.1678	- - -	2.13
0.1696	2.33	2.31
0.1998	2.91	- - -
0.2364	- - -	4.44
0.2595	4.49	4.50
0.2997	5.49	5.79
0.3254	- - -	6.53
0.3547	7.99	7.98
0.3778	9.05	9.02
0.3900	- - -	9.73
0.4138	- - -	10.54
0.4215	- - -	9.79
0.4402	9.44	- - -
0.4941	7.70	7.77
0.519	- - -	7.14
0.522	7.33	7.20
0.543	7.60	6.34
0.660	- - -	4.90
0.667	4.62	4.69
0.748	3.46	3.53
0.790	3.23	3.17
0.840	2.61	2.63
1.048	1.47	1.44
1.049	1.50	1.48
1.299	1.60	- - -
1.445	- - -	1.94
1.682	1.69	1.70
2.293	2.01	2.01
2.845	2.22	2.20
3.095	2.39	2.32
3.541	2.61	2.62
3.983	2.68	2.63
6.05	3.76	3.84
8.37	5.32	5.23

[a] Equilibrium was approached from undersaturation.

[b] Equilibrium was approached from supersaturation.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Gold(III) hydroxide; $Au(OH)_3$; [1303-52-2]	Bezzubenko, A. A.; Peshchevitskii, B. I. *Izvest. Sibir. Otdel. Akad. Nauk SSSR* 1961, 62-7.
(2) Nitric acid; HNO_3; [7697-37-2]	
(3) Water; H_2O; [7732-18-5]	
VARIABLES:	**PREPARED BY:**
Concentration of nitric acid at 25 ± 0.05°C.	T. Michalowski

EXPERIMENTAL VALUES:

Solubility of $Au(OH)_3$ in aqueous HNO_3 at 25°C.

C_{HNO_3}/mol dm^{-3}	$10^3 C_{Au}$/mol dm^{-3}
10.1	380
7.64	79
6.05	23
4.84	7.4
4.03	4.1
2.84	1.2
2.42	0.57
2.42	0.63
1.94	0.44
1.55	0.36
1.21	0.27
0.96	0.20
0.60	0.10
0.41	0.070
0.32	0.057

One determination at 40°C showed that the solubility in a HNO_3 concentration of 1.35 mol dm^{-3} is 2.5 x 10^{-4} mol Au dm^{-3}.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Solid $Au(OH)_3$ was treated with concentrated HNO_3 and heated strongly. The resulting solution was treated with known volumes of water to precipitate $Au(OH)_3$. The mixtures were then placed in a constant temperature bath at 25°C for an unspecified time. After this the mixture was filtered through a glass filter. The acid content of the filtrate was determined by titration with borax or with NaOH. The gold content of the filtrate was determined colorimetrically after forming Au-bromide complexes.

SOURCE AND PURITY OF MATERIALS:

$Au(OH)_3$ was formed by treating $KAuCl_4$ with Na_2CO_3 at an elevated temperature and then washing the product with H_2SO_4 and with dilute HNO_3. All materials were of a chemically pure grade.

ESTIMATED ERROR:

No details are given.

REFERENCES: