COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonium fluoride; NH_4F; [12125-01-8]	Kuznetsova, Z.M.; Samoilov, P.P.; Fedotova, T.D.; Fedorov, V.E.
(2) Ammonium iodate; NH_4IO_3; [13446-09-8]	*Izv. Sib. Otd. Akad. Nauk SSR Ser. Khim. Nauk* 1972, (1), 99-104.
(3) Water; H_2O; [7732-18-5]	
VARIABLES:	**PREPARED BY:**
T/K = 298 composition	Hiroshi Miyamoto

EXPERIMENTAL VALUES:

Composition of saturated solutions

NH_4F		NH_4IO_3		Nature of the solid phase[a]
mass %	mol % (compiler)	mass %	mol % (compiler)	
-	-	3.67[b]	0.355	A
9.48	4.88	0.72	0.071	"
16.14	8.603	0.51	0.052	"
31.86	18.59	0.28	0.031	"
43.08	29.98	0.23	0.028	"
46[c]	29.3	-	-	B

[a] A = NH_4IO_3; B = NH_4F

[b] Value obtained from ref 1.

For the binary system the compiler computes the following:

soly of NH_4IO_3 = 0.198 mol kg^{-1}

[c] Value obtained from ref 2.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The isothermal method was used. Mixtures of salts and water were stirred in sealed Teflon tubes placed in a thermostat. After equilibrium was established, aliquots of the liquid phases were withdrawn. The ammonia content was determined by distillation method (ref 3). Fluorine was determined with lanthanium nitrate by potentiometric titration using a fluoride ion selective electrode. The iodate concentration was determined iodometrically. The method used to determine composition of the solid phases was not specified.

SOURCE AND PURITY OF MATERIALS:

"Analytical" or chemically "pure" grade salts were used.

ESTIMATED ERROR:

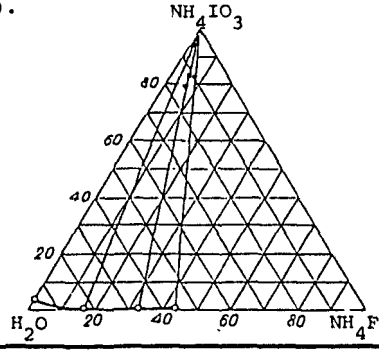
Nothing specified.

REFERENCES:

1. Kirgintsev, A.N.; Trushiova, L.N.; Lavrenteva, V.G. *Rastvorinost Neorganicheskikh Veshchestv v Vode (Solubilities of Inorganic Substances in Water)*
2. Yatlov, V.S.; Polyakova, E.M. *Zh. Obshch. Khim.* 1945, *15*, 724.
3. Kolthoff, I.M.; Sandell, E.B. *Textbook of Quantitative Inorganic Analysis.* Macmillan Co. N.Y. 1953.

COMMENTS AND/OR ADDITIONAL DATA:

The phase diagram is given below (based on mass %).



COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonium iodate; NH_4IO_3; [13446-09-8] (2) Iodic acid; HIO_3; [7782-68-5] (3) Water; H_2O; [7732-18-5]	Meerburg, F.A. *Z. Anorg. Allg. Chem.* 1905, *45*, 324-44.
VARIABLES: T/K = 303 Composition	**PREPARED BY:** Hiroshi Miyamoto

EXPERIMENTAL VALUES: Composition of saturated solutions at 30°C

Iodic Acid		Ammonium Iodate		Nature of the solid phase[a]
mass %	mol % (compiler)	mass %	mol % (compiler)	
0	0	4.20[b]	0.408	A
2.54	0.276	3.89	0.386	"
4.52	0.501	3.83	0.387	A+C
4.51	0.500	3.86	0.390	"
4.56	0.505	3.75	0.379	"
4.73	0.523	3.53	0.356	C
6.57	0.729	1.94	0.196	"
8.45	0.947	1.09	0.111	"
9.12	1.026	0.91	0.091	"
24.00	3.155	0.62	0.074	"
36.01	5.479	0.41	0.057	"
44.43	7.613	0.39	0.061	"
58.21	12.57	0.37	0.073	"
76.35	25.07	0.31	0.093	C+B
76.70[b]	25.21	0	0	B

[a] A = NH_4IO_3; B = HIO_3; C = $NH_4IO_3.2HIO_3$

[b] For binary systems the compiler computes the following:

soly of HIO_3 = 18.71 mol kg^{-1}

soly of NH_4IO_3 = 0.227 mol kg^{-1}.

METHOD/APPARATUS/PROCEDURE:

A mixture of NH_4IO_3, HIO_3 and water was placed in a bottle, and the bottle agitated in a thermostat for a week or more at a desired temperature. Equilibrium was established from supersaturation.

The iodic acid and ammonium iodate contents were determined by iodometric titration, and the details of the analytical method were probably similar to those of KIO_3-HIO_3-H_2O system. (See the compilation for this system.)

The composition of the solid phase was determined by the method of residues.

SOURCE AND PURITY OF MATERIALS:

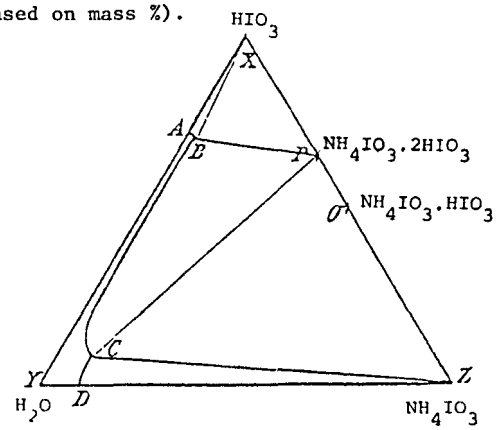
Nothing specified.

ESTIMATED ERROR:

Nothing specified.

COMMENTS AND/OR ADDITIONAL DATA:

The phase diagram is given below (based on mass %).



COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonium iodate; NH_4IO_3; [13446-09-8]	Tatarinov, V.A.
(2) Iodic acid; HIO_3; [7782-68-5]	*Uch. Zap. Yavostov. Gos. Pedagog. Inst.* 1971, No. 95, 113-5.
(3) Water; H_2O; [7732-18-5]	
VARIABLES:	**PREPARED BY:**
T/K = 322	Hiroshi Miyamoto
composition	

EXPERIMENTAL VALUES:

Composition of saturated solutions

Ammonium Iodate mass %	Ammonium Iodate mol % (compiler)	Iodic Acid mass %	Iodic Acid mol % (compiler)	Nature of the solid phase
7.62[b]	0.764	-	-	A
6.51	0.671	3.95	0.447	"
6.32	0.670	6.93	0.806	A+C
6.31	0.669	6.96	0.810	"
5.07	0.547	9.89	1.16	C
0.43	0.105	68.41	18.34	"
0.42	0.124	75.82	24.60	B+C
-	-	76.53[b]	25.03	B

[a] A = NH_4IO_3; B = HIO_3; C = $NH_4IO_3.2H_2O$.

[b] For binary systems the compiler computes the following:

soly of NH_4IO_3 = 0.428 mol kg^{-1}

soly of HIO_3 = 18.54 mol kg^{-1}

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The isothermal method was used. Equilibrium was reached in 24 hours. Aliquots of the liquid and solid phases were used for analysis of NH_4^+ and IO_3^-. NH_4^+ was determined by the bromate method (ref 1), and IO_3^- determined iodometrically.

The composition of the solid phase was determined by Schreinemakers' method and chemical analyses.

SOURCE AND PURITY OF MATERIALS:

"Chemically pure" grade iodic acid was recrystallized from water. Ammonium iodate was made from iodic acid and ammonium carbonate. The product was washed with a large quantity of cold water and then recrystallized.

REFERENCES:

1. Levy, B. *Z. Anal. Chem.* 1931, *84*, 98.

ESTIMATED ERROR:

Nothing specified.

COMMENTS AND/OR ADDITIONAL DATA:

The phase diagram is given below.