COMPONENTS:

(1) Potassium chlorate; $KClO_3$; [3811-04-9]

(2) 1,2-Ethandiol (ethylene glycol); $C_2H_6O_2$; [107-21-1]

ORIGINAL MEASUREMENTS:

Isbin, H.S.; Kobe, K.A.

J. Am. Chem. Soc. 1945, *67*, 464-5.

VARIABLES:

T/K = 298.15

PREPARED BY:

Hiroshi Miyamoto

EXPERIMENTAL VALUES:

The solubility of $KClO_3$ in ethylene glycol at 25°C is given:

1.21 g/100 g solvent	(author).
9.87×10^{-2} mol kg^{-1}	(compiler).

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The solvent and excess solid were sealed in soft-glass test-tubes and rotated for at least one week in a thermostated water bath. All analyses were made on a weight basis by use of weighing pipets. Both the standard gravimetric determination of chloride and the volumetric method, using dichlorofluorescein as an indicator, were used. The chlorate was reduced to the chloride by boiling with excess sulfurous acid.

SOURCE AND PURITY OF MATERIALS:

Technical grade ethylene glycol (Carbide and Carbon Chem. Co) was purified by fractionation. Analytical grade $KClO_3$ was used.

ESTIMATED ERROR:

Soly: precision within 4 %.
Temp: precision ± 0.08 K

REFERENCES:

COMPONENTS:

(1) Potassium chlorate; $KClO_3$; [3811-04-9]

(2) 2-Aminioethanol (monoethanolamine); C_2H_7NO; [141-43-5]

ORIGINAL MEASUREMENTS:

Isbin, H.S.; Kobe, K.A.

J. Am. Chem. Soc. 1945, *67*, 464-5.

VARIABLES:

T/K = 298.15

PREPARED BY:

Hiroshi Miyamoto

EXPERIMENTAL VALUES:

The solubility of $KClO_3$ in monoethanolamine at 25°C is

0.30g/100g solvent	(authors)
2.45×10^{-2} mol kg^{-1}	(compiler)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The solvent and excess solid were sealed in a soft-glass test-tube and rotated for at least one week in a thermostated water bath. All analyses were made on a weight basis by use of weighing pipets. Both the saturated gravimetric determination of chloride and the volumetric method using dichlorofluoresein as an indicator were used. The chlorate was reduced to the chloride by boiling with excess sulfurous acid.

SOURCE AND PURITY OF MATERIALS:

Technical grade monoethanolamine (Carbide and Carbon Chem. Co) was purified by fractionation. Analytical grade $KClO_3$ was used.

ESTIMATED ERROR:

Soly: precision within 4 %.
Temp: precision ± 0.08 K.

REFERENCES:

COMPONENTS:

(1) Potassium chlorate; $KClO_3$; [3811-04-9]

(2) 1,2-Ethanediamine (ethylenediamine); $C_2H_8N_2$; [107-15-3]

ORIGINAL MEASUREMENTS:

Isbin, H.S.; Kobe, K.A.

J. Am. Chem. Soc. 1945, *67*, 464-5.

VARIABLES:

T/K = 298.15

PREPARED BY:

Hiroshi Miyamoto

EXPERIMENTAL VALUES:

The solubility of $KClO_3$ in ethylenediamine at 25°C is

0.145g/100g solvent	(authors)
1.18×10^{-2} mol kg^{-1}	(compiler)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The solvent and excess solid were sealed in soft-glass test-tubes and rotated for at least one week in a thermostated water bath. Analysis was made on a weight basis by use of weighing pipets. Both the standard gravimetric determination of chloride and the volumetric method, using dichlorofluoresein as an indicator were used. The chlorate was reduced to the chloride by boiling with excess sulfurous acid.

SOURCE AND PURITY OF MATERIALS:

Ethylenediamine was dehydrated and purified by the method given in ref (1). Analytical grade $KClO_3$ was used.

ESTIMATED ERROR:

Soly: precision within 4 %.

Temp: precision ± 0.08 K (authors).

REFERENCES:

1. Putnam, G.L.; Kobe, K.A. *Trans. Electrochem. Soc.* 1938, *74*, 609.

COMPONENTS:

(1) Potassium chlorate; $KClO_3$; [3811-04-9]

(2) Dimethylformamide; C_3H_5NO; [68-12-2]

ORIGINAL MEASUREMENTS:

Paul, R.C.; Sreenathan, B.R.

Indian J. Chem. 1966, *4*, 382-6.

VARIABLES:

One temperature: 298.2 K

PREPARED BY:

Mark Salomon

EXPERIMENTAL VALUES:

The solubility of $KClO_3$ in $HCON(CH_3)_2$ was reported as

18.1 g/100 g solvent (1.477 mol kg^{-1}, compiler).

The solid phase is the anhydrous salt.

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Isothermal method used. Excess salt and 10 ml of solvent were placed in a Pyrex test tube, sealed, and rotated in a constant temperature water-bath for 24-30 hours. The seal was broken in a dry box and the slurry quickly filtered. The authors state that the metal was estimated from a known quantity of the saturated (filtered) solution, but no details were given. The saturated solution was colorless.

SOURCE AND PURITY OF MATERIALS:

Dimethylformamide (Baker "analyzed" grade) was further purified as described in (1).

A.R. grade $KClO_3$ was warmed and placed under vacuum for 6-8 hours.

ESTIMATED ERROR:

Soly: nothing specified.

Temp: precision ± 0.1 K.

REFERENCES:

1. Paul, R.C.; Guraya, P.S.; Sreenathan, B.R. *Indian J. Chem.* 1963, *1*, 335.

COMPONENTS:

(1) Potassium chlorate; $KClO_3$; [3811-04-9]

(2) Ammonia; NH_3; [7664-41-7]

ORIGINAL MEASUREMENTS:

Hunt, H.; Boncyk, L.

J. Am. Chem. Soc. 1933, 55, 3528-30.

VARIABLES:

T/K = 298

PREPARED BY:

Hiroshi Miyamoto and Mark Salomon

EXPERIMENTAL VALUES:

The solubility of $KClO_3$ in liquid ammonia at 25°C was reported as

2.52 g/100 g NH_3

0.206 mol kg^{-1} (compilers)

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

Two methods were used as described in (1).

Method I. 25 ml test tubes with a constriction at the middle were employed. About 10-25 g NH_3 were condensed in the bottom, and the dry salt contained in a small tube tightly covered with cotton cloth was added to the test tube; this small tube remained in the upper part of the test tube as it could not pass the constriction in the middle of the test tube. The top of the test tube was drawn to a tip and sealed, and the tube inverted and placed in a thermostat at 25°C. Equilibrium between NH_3 and the excess salt in the small covered tube required 1-3 weeks with periodic shaking. The test tube was then inverted and only the satd sln drained into the lower end (excess solid remained in the small tube covered with the cotton cloth). The sln was frozen and sealed at the constriction, and weighed. The seal was then broken and the NH_3 boiled off, and the residue weighed.

Method II. Excess NH_3 was condensed on a weighed amount of salt in a tube fitted with a stopcock. After thermostating at 25°C, NH_3 was slowly permitted to escape through the stopcock until a crystal of solid appeared and remained undissolved upon prolonged shaking.

Authors state that the error due to the condensation of gaseous NH_3 was not significant since the dead space was kept to a minimum of about 30 cm^3. However this amount of dead space was stated to limit the precision of the method to 0.5 %.

SOURCE AND PURITY OF MATERIALS:

Reagent grade $KClO_3$ was recrystallized three times from water and then from "a suitable" anhydrous solvent. The salt was dried to constant weight in a vacuum oven.

Purification of NH_3 not specified, but probably similar to that described in (1). In (1) commercial anhyd ammonia was stored over metallic sodium for several weeks before use.

ESTIMATED ERROR:

Soly: accuracy probably around ± 1-2 %. (compilers).

Temp: 25.00 + 0.025°C: accuracy established by NBS calibration (see ref (1)).

REFERENCES:

1. Hunt, H.; *J. Am. Chem. Soc.* 1932, 54, 3509.