COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium chloride; LiCl; [7447-41-8] (2) Lithium chlorate; $LiClO_3$; [13453-71-9] (3) Water; H_2O; [7732-18-5]	Campbell, A.N.; Griffiths, J.E. *Can. J. Chem.* 1956, *34*, 1647-61.
VARIABLES: Composition T/K = 276.15 to 298.15.	**PREPARED BY:** Hiroshi Miyamoto

EXPERIMENTAL VALUES:

Composition of saturated solutions

t/°C	Lithium Chlorate mass %	Lithium Chlorate mol % (compiler)	Lithium Chloride mass %	Lithium Chloride mol % (compiler)	Nature of the solid phase[a]
3.00	56.7[b]	20.7	-	-	A
	55.8	20.4	1.3	1.0	"
	62.2	26.0	4.3	3.8	"
	66.0	28.9	2.8	2.6	"
	68.7	31.0	1.5	1.4	"
	70.8	32.6	-	-	"
	73.6	35.7	-	-	B
	65.6	30.1	7.1	7.0	"
	62.4	27.9	9.4	9.0	"
	58.5	25.6	13.1	12.2	"
	57.5	24.9	13.7	12.6	B+E
	44.7	16.9	19.9	16.0	E
	40.9	14.9	22.1	17.2	D+E
	37.4	13.2	23.5	17.7	D
	23.9	7.43	29.1	19.3	"
	-	-	41.0	22.8	"

continued.....

AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE:

The isothermal method was used. Equilibrium was approached from two directions. A given solution was divided into equal parts, and one part was heated to complete disolution of the solid, and the second part was completely frozen. Both portions were then thermostated until the compositions of the liquid phases were identical. For solutions up to 10 % LiCl, equilibrium was attained after 2-3 days of stirring. For higher LiCl concentrations, 5-6 days of stirring were required to attain equilibrium.

To determine $LiClO_3$ compositions, aliquots were transferred to 250 ml iodine flasks to which 40 ml concentrated orthophosphoric acid were added followed by the addition of about 0.1 g sodium carbonate to exclude air from the flask. Approximately 25 ml of iodate-free potassium iodide solution (0.2 gm/ml) was added, and the stoppered flask allowed to stand at room temperature for 60 to 70 min. The free iodine was titrated with sodium thiosulphate. Standardization of the method with pure sodium chlorate indicated an accuracy of ± 0.4 %.

The chloride content of solutions containing appreciable amounts of chloride was determined volumetrically with silver nitrate solution using an alcoholic solution of sodium dichlorofluoresceinate for the indicator. For solutions containing less than five percent chloride, the standard gravimetric method was used.

Compositions of the solid phases were determined by Schreinemakers' method.

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium chloride; LiCl; [7747-41-8]	Campbell, A.N.; Griffiths, J.E.
(2) Lithium chlorate; $LiClO_3$; [13453-71-9]	*Can. J. Chem.* 1956, *34*, 1647-61.
(3) Water; H_2O; [7732-18-5]	

EXPERIMENTAL VALUES: (Continued)

Composition of saturated solutions

t/°C	Lithium Chlorate mass %	Lithium Chlorate mol % (compiler)	Lithium Chloride mass %	Lithium Chloride mol % (compiler)	Nature of the solid phase[a]
6.00	58.7[b]	22.1	-	-	A
	58.3	22.4	2.5	2.0	"
	62.7	25.6	1.8	1.6	"
	68.1	29.8	-	-	A
	74.1	36.3	-	-	B
	70.0	32.9	2.7	2.7	"
	69.7	32.9	3.4	3.4	"
	65.8	30.3	7.1	7.0	"
	64.9	29.6	7.5	7.3	"
	62.6	28.1	9.6	9.2	"
	61.4	27.4	10.7	10.2	"
	60.4	27.0	12.3	11.7	B+E
	57.5	24.9	13.7	12.6	E
	54.8	23.1	15.2	13.6	"
	53.9	22.3	15.0	13.2	"
	45.2	17.2	20.0	16.2	"
	38.2	13.6	23.7	18.1	"
	37.2	13.1	24.0	18.1	"
	36.2	12.7	24.6	18.4	D+E
	35.7	12.5	24.9	18.5	D
	34.1	11.7	25.4	18.6	"
	24.4	7.67	29.7	19.9	"
	23.5	7.33	30.0	19.9	"
	18.3	5.47	32.5	20.7	"
	16.3	4.80	33.5	21.0	"
	-	-	41.1	22.9	

AUXILIARY INFORMATION

SOURCE AND PURITY OF MATERIALS:

A 1 mol dm^{-3} barium chlorate solution was heated to about 85°C, and a 1 mol dm^{-3} lithium sulfate solution was added slowly with a dropping funnel until equivalence was reached. The precipitated barium sulfate was removed by repeated filtration. The solution was evaporated slowly up to an approximate concentration of 50% lithium chlorate. The filtered solution was transferred to a 250 ml Claissen flask and dehydration was carried out under a reduced pressure of less than 5 mm Hg, the distillate being absorbed in concentrated sulfuric acid. In this process, the temperature was kept below 85°C.

Upon cooling the solution to room temperature, the salt crystallized, and was placed under vacuum over phosphorus pentoxide. To remove the last trace of water, the salt was placed in a vacuum furnace over phosphrous pentoxide, and maintained at 80°C.

The source of lithium chloride was not given.

ESTIMATED ERROR:

Soly: accuracy of ± 0.4 % (authors)

Temp: precision ± 0.05 K (authors)

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Lithium chloride; LiCl; [7747-41-8]	Campbell, A.N.; Griffiths, J.E.
(2) Lithium chlorate; $LiClO_3$; [13453-71-9]	*Can. J. Chem.* 1956, *34*, 1647-61.
(3) Water: H_2O; [7732-18-5]	

EXPERIMENTAL VALUES (continued)

Composition of saturated solutions

t/°C	Lithium Chlorate mass %	Lithium Chlorate mol % (compiler)	Lithium Chloride mass %	Lithium Chloride mol % (compiler)	Nature of the solid phase[a]
8.50	75.0[b]	37.4	0	0	B
	73.4	36.2	1.5	1.6	"
	72.0	34.8	1.9	2.0	"
	66.1	30.9	7.7	7.7	"
	65.6	30.8	8.8	8.8	"
	64.2	30.4	11.2	11.3	B+E
	63.5	29.6	11.2	11.1	"
	62.7	29.0	11.6	11.4	"
	60.5	27.1	12.3	11.7	E
	50.8	20.5	17.4	15.0	"
	31.3	10.6	27.7	19.9	"
	30.6	10.2	27.8	19.9	D+E
	28.2	9.24	28.9	20.2	D
	22.5	7.07	32.2	21.6	"
	10.4	2.95	37.3	22.6	"
	5.6	1.54	39.7	23.2	"
	-	-	42.7	24.1	"
25.00	82.6[b]	48.6	-	-	C
	78.7	44.7	3.3	4.0	"
	76.4	42.4	5.0	5.9	"
	76.1	42.0	5.1	6.0	"
	75.7	41.7	5.6	6.6	"
	75.8	41.9	5.7	6.7	"
	75.9	42.1	5.8	6.9	"
	72.3	39.1	9.2	10.6	C+E
	71.8	38.4	9.2	10.5	"
	71.6	38.2	9.2	10.5	"
	67.7	34.0	10.7	11.5	E
	41.7	15.6	23.3	18.6	"
	33.8	11.8	27.7	20.6	"
	27.0	8.91	31.3	22.0	"
	25.5	8.28	31.7	22.0	"
	-	-	45.5	26.2	"

[a] A = $LiClO_3.3H_2O$; B = $LiClO_3.H_2O$; C = $(LiClO_3)_4.H_2O$; D = $LiCl.2H_2O$; E = $LiCl.H_2O$

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

soly of $LiClO_3$ = 14.5 mol kg^{-1} at 3.00°C
= 15.7 mol kg^{-1} at 6.00°C
= 33.2 mol kg^{-1} at 8.50°C
= 52.5 mol kg^{-1} at 25.00°C