which had been maintained for two days at 100° C., yielded no α-crystals, but the red β-compound only.

PROPERTIES OF THE α-AND β-CRYSTALS.

The yellow crystals are soluble in water, but insoluble in hydrochloric acid and in alcohol. From the aqueous solution all the chlorine is precipitated in the cold by silver nitrate. On standing at 110° for two days, the yellow crystals are changed partly into a red powder, with separation of chromic oxide. These crystals evidently correspond with the *luteochromium* compounds obtained by Jörgensen[1] of the general formula $Cr_2 12NH_3X_6$.

The red compound crystallizes in small perfectly formed cubes and octahedra. They dissolve in cold water slowly, while hot water causes a separation of chromium hydroxide. Hydrochloric acid and alcohol exert no solvent action on them. Further, when the crystals are treated with liquid ammonia, no change takes place, and on addition of a small quantity of violet chromium chloride to the mixture of the salt and ammonia the chromic chloride reacts at once with the ammonia, yielding a pink powder from which the β-crystals may be separated mechanically. On treating the mixed crystals and powder with cold water, the latter readily dissolved away, leaving the red crystals untouched. The composition of this β-compound, $Cr_2 10NH_3Cl_6$, points to its being *chlorpurpureochromium chloride.*

CHEMICAL LABORATORY, UNIVERSITY OF TORONTO.

NOTE ON THE ACTION OF METHYLAMINE ON CHROMIC CHLORIDE.

BY W. R. LANG AND E. H. JOLLIFFE.

Received January 30, 1904.

A SOLUTION of methylamine was gently heated and the gas conducted through drying towers filled with potassium hydroxide to a glass tube containing chromium chloride and immersed in a freezing-mixture at a temperature of —10°. As soon as the liquid methylamine collected in the tube, combination between it and the chromic chloride took place and a substance of a pale pink color, closely resembling the ammonia compound (Lang and Carson), was formed. The excess of methylamine was allowed to pass off

[1] *J. prakt. Chem.*, [2] **30**, 1.

and the contents of the tube dissolved in water. The substance was very soluble and the least possible quantity of water was used. The solution, on rapid evaporation *in vacuo*, yielded dark red crystals. Considerable difficulty was experienced in obtaining these crystals, owing to the rapidity with which the solution decomposed into chromic hydroxide; consequently the analysis of the crystals obtained by repeated operations had to be made on very small quantities. Analysis of the crystals thus obtained from the compound at a temperature of 15° gave:

	Found. Per cent.	Calculated for $Cr_2Cl_6 10CH_3NH_2$. Per cent.
Chromium	16.25	16.68
Chlorine	35.20	33.92
Methylamine	48.50	49.6
	99.95	100.00

Crystals produced in a similar manner from the original compound, previously heated to 94°, gave:

	Found. Per cent.	Calculated. Per cent.
Chromium	16.55	16.61
Chlorine	34.19	33.86
Methylamine	48.89	49.53
	99.63	100.00

The composition of these crystals is therefore $Cr_2Cl_6, 10CH_3NH_2$, corresponding to the similarly constituted chloropurpureochromium chloride obtained (Lang and Carson) from anhydrous ammonia and chromic chloride.

On heating to 100° the compound formed by the direct action of methylamine on chromic chloride, analysis showed it to contain 43.26 per cent. of methylamine, which would point to its composition being Cr_2Cl_6, $8CH_3NH_2$, the percentage in this latter being 43.8. At 124° C. complete decomposition into Cr_2O_3 took place.

The analogy between the crystals thus obtained and the chloropurpureo compound is evident. The great difficulty of obtaining pure methylamine on the American continent prevented the investigation of these substances being continued further or more accurate analyses being made. Aniline and methylaniline had no action on the violet chromic chloride whether in the cold or when heated together. The effect of heating for any length of time in a sealed tube was not tried.

CHEMICAL LABORATORY, THE UNIVERSITY OF TORONTO, CANADA.