the neodymium compound is very soluble in boiling water, it tends to cling somewhat to those elements forming slightly soluble cacodylates.

Double Salts.

Lanthanum Chloride Cacodylate, $2La[(CH_3)_2AsO_2]_3.LaCl_3.18H_2O$.—Lanthanum cacodylate forms double salts with the sulfate, nitrate, chloride, bromide, iodide, methane-trisulfonate, etc., of lanthanum. Although lanthanum cacodylate and lanthanum nitrate are both very soluble in water, their dilute solutions, upon mixing, give a precipitate which is nearly insoluble.

When solutions of lanthanum chloride and the cacodylate are mixed, a double salt rapidly separates as a mass of fine crystals. These were filtered off, washed, dried and analyzed. The results showed that one molecule of lanthanum chloride united with two molecules of lanthanum cacodylate.

Calculated: La_2O_3, 29.28; Cl, 6.37. Found: La_2O_3, 29.43; Cl, 6.24.

Cerium Chloride Cacodylate, $2Ce[(CH_3)_2AsO_2]_3.CeCl_3.18H_2O$.—This compound separated upon mixing solutions of cerium chloride and cerium cacodylate. It consisted of white fibrous crystals. The CeO_2 content showed that its composition resembled that of the corresponding lanthanum salt.

Calculated: CeO_2, 30.87. Found: CeO_2, 30.88.

Cerium Sulfate Cacodylate was obtained as a thick precipitate by mixing the sulfate and cacodylate solutions. The mass filtered badly, but was finally washed and dried. The analysis indicated that it probably consisted of one molecule of cerous sulfate in combination with half a molecule of cerous cacodylate.

Neodymium Chloride Cacodylate, $2Nd[(CH_3)_2AsO_2]_3.NdCl_3.18H_2O$, was prepared in a similar manner to the double chlorides described above. It formed very pale amethyst crystals, which were of a fibrous nature.

Calculated: Nd_2O_3, 30.00; Cl, 6.31. Found: Nd_2O_3, 30.04; Cl, 6.31.

DURHAM, N. H.

THE PREPARATION OF OXAN AND THE PROPERTIES OF SALTS OF α- AND β-OXAN.

BY A. P. LIDOV.

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In the account of my paper to the VIIIth International Congress of Applied Chemistry, "The Preparation of Oxan and of the Existence of a Higher Grade of its Oxidation, Peroxan,"[1] there is a small inaccuracy, occasioned possibly by my having employed a not quite correct terminology, borrowed from Comey's "Dict. of Chemical Solubilities, Inorganic," p. 268, 1896.

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[1] *C. A.*, 6, 3093 (1912).

Oxan is most easily obtained by reciprocal action of charcoal at 150–300° *not with* NO_2 (nitrogen tetroxide), which is an energetic oxidizer and from which depends the formation of peroxan and a comparatively large quantity of carbon dioxide, *but with* NO (nitric oxide).

Later experiments have shown that still purer oxan can be obtained by the reciprocal action of charcoal with N_2O, nitrous oxide, under like conditions. During the formation of oxan there takes place also an elimination of nitrogen and perhaps also of a compound indifferent nitrogenous gas, the elimination of which prevents the further oxidation of the oxan which is formed.

Although α-oxan $O^{-}C\equiv N$, or simply oxan, and β-oxan $O^{-}N\equiv C$, or iso-oxan are formed by the reciprocal action of nitric oxide (NO) with charcoal, with the difference that the former is more easily obtained when these reagents act reciprocally at higher temperatures and the latter at ordinary temperatures, nevertheless the properties of these two gases are very different.

α-Oxan is a very stable gas and does not decompose by heating with platinum asbestos, while β-oxan, under the same conditions, rapidly decomposes, if we can judge by the change in volume and weight.

This difference in their properties is also observed in the properties of the corresponding salts. Although the acidic peculiarities are quite distinct in α-oxan, which, by its properties, shows great analogy to carbon dioxide, nevertheless α-oxan dissolved in water shows itself to be a much weaker acid than carbonic acid, for the latter eliminates oxan from a solution of oxan salts which are all more easily soluble than carbonates.

Sodium salts of α- and β-oxan differ much from each other; the former when heated remaining stable, while the latter decomposes with explosion.

The silver salt of α-oxan is very similar to the silver salt of carbonic acid; like the latter it has a slightly yellow tint and very rapidly darkens, when exposed to light.

The silver salt of β-oxan is of a pure white color and is much more resistant to light.

A great difference is to be found in the properties of the iron oxanates; the iron oxanate of α-oxan, which is formed by the reciprocal action of a strong solution of α-sodium oxanate salts with a solution of ferric chloride (Fe_2Cl_6), resembles ocher as to color and similarly to the corresponding iron salt of carbonic acid, decomposes with the elimination of gas. The iron salt of β-oxan obtained under similar conditions forms a voluminous, intensely red precipitate having a brick shade. It is absolutely stable and does not decompose even when filtered. Dried at ordinary temperatures in a desiccator it explodes when heated, just as the sodium salt of β-oxan.

In weak solutions with ferric chloride neither α-oxan, nor β-oxan salts give a precipitate.

Calcium salts both of α-oxan and of β-oxan are amorphous, gelatinous substances. Compared with calcium carbonate they are much more soluble in water (up to 1 gram to a liter).

The sodium salt of α-oxan like sodium carbonate forms with manganous chloride ($MnCl_2$) an abundant white precipitate, while under the same conditions the sodium salt of β-oxan gives no precipitate. Aluminium chloride acts in the same manner with the difference that the precipitates formed from sodium carbonate and sodium α-oxanate salts, decompose with elimination of gases; but the sodium salt of β-oxan under the same conditions and at the same dilution (2.5 grams to 250 cc. of water) does not give a precipitate and does not eliminate gas. Both the salts of α-oxan and the salts of β-oxan in time lose, in a larger or smaller degree, the property of eliminating gas, or in other words the quantity of gas eliminated diminishes. This fact is more sharply pronounced in β-oxan salts. This property is most probably due to polymerization and may be dependent upon the presence of certain admixtures acting as catalyzers, for in certain cases it is more pronounced than in others.

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THE INFLUENCE OF LEAD ON THE FERROCYANIDE TITRATION OF ZINC.

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Of all the volumetric methods for the determination of zinc in ores, the procedure as outlined in the "Modified Waring Method"[1] is by far the most satisfactory for complex ores. The principal service which this method renders is the removal of all of the heavy metals which interfere with the ferrocyanide titration. In many zinc ores, notably those from the Mississippi Valley, the heavy metals which thus interfere are absent, hence the separations called for in this method can be materially simplified.

While it is universally acknowledged that iron must not be present in the ferrocyanide titration for zinc, the influence of lead has been a much mooted question. Béringer[2] gives quantitative data to show that lead gives a higher result. Seaman[3] gives data to show the bad influence of lead. Stone[4] is of the opinion that lead alone need not be separated, but that if the lead be present the solution must be quite strongly acid. Miller[5] indicates conditions which allow for the presence of lead.

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[1] THIS JOURNAL, 29, 265 (1907).

[2] Béringer, "Text-book of Assaying."

[3] THIS JOURNAL, 29, 207 (1907).

[4] *Ibid.*, 17, 475, 476 (1895).

[5] Miller, "Quantitative Analysis for Mining Engineers."