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HYDRATED COMPOUNDS OF URANIUM FROM URANIUM (IV) OXYCARBONATE

THE isolation of uranium (IV) oxycarbonate has been recently reported by us.¹ This compound undergoes simultaneous aerial oxidation and dehydration and results in the formation of pure uranyl carbonate. Carbonates are suitable starting materials for the preparation of different salts by their action with respective acids. The preparation of uranium (IV) oxycarbonate offers a new route for the preparation of uranium (IV) compounds in an expeditious and convenient manner. This method of preparing uranium (IV) compounds has been examined with a view to explore the nature of the compounds obtained, particularly the intensity of colour, crystal size, water of hydration and the formation of normal or oxysalts. Thus utilising the freshly prepared moist oxycarbonate as the starting material, uranium tetrafluoride, uranium (IV) oxynitrate, oxyformate, oxyacetate and the normal oxalate were prepared. In each case hydrated compounds were obtained.

Hydrated uranium tetrafluoride with 0.5, 2.0 and 2.5 molecules of water have been prepared.^{2,3} We have prepared the compound both with 1 and 1.5 molecules of water.⁴⁻⁶ In the present method, the compound is obtained as a fine green powder with one molecule of water by the action of 40% HF on the oxycarbonate.

Uranium (IV) oxyformate was prepared by Rosenheim⁷ with 3 molecules of water. We prepared the compound as dark-green crystals and also in the powder form with 1.5 molecules of water.^{8,9} When prepared from the oxycarbonate by the action of formic acid in presence of alcohol, it is formed with 3.0 molecules of water in a powdered form and a dirty-green colour, as obtained by Rosenheim.

The photochemical isolation of uranium (IV) oxyacetate monohydrate has been recently reported by us.¹⁰ The reaction of acetic anhydride on the moist oxycarbonate results in the production of uranium (IV) oxyacetate with 2.5 molecules of water as a fine pale-green powder.

The isolation of oxysalts by the above process led us to attempt the action of oxalic acid, with a view to prepare the oxyoxalate, the compound which has been reported by us for the first time, during the photolysis of uranyl formate and oxalic acid.¹¹ But when oxalic acid solution was added to the oxycarbonate, the uranium (IV) dioxalate and not the oxyoxalate was obtained with the same 6 molecules of water of hydration as fine green crystals.

Uranium (IV) oxynitrate was prepared by Benrath¹² by the photochemical reduction of uranyl nitrate and alcohol. We prepared the compound by dissolving the oxycarbonate in minimum amount of 2N HNO₃ and adding excess of dioxan when a pale-green compound separated out. The compound on drying at room temperature in vacuum gave uranium (IV) oxynitrate with 4 molecules of water.

The analyses of the various constituents were carried out as reported earlier (*loc. cit.*).

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REMARKS ON PINGUITE

DANA classifies Pinguite among the varieties of chloropal with the following description: "... is siskin- and oil-green extremely soft, like new made soap, with a slightly resinous lustre not adhering to tongue". He considers Pinguite as "... really a member of the chlorite family ... But some Pinguite is chloropal M.A. 10, 23). Anyhow, Pinguite is a hydrated silicate of ferric iron with the general formula $\cdot H_4Fe_2Si_2O_9$... and is included in the montmorillonite family of the group of clay minerals.