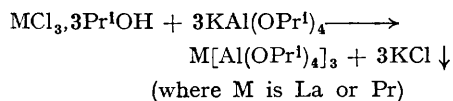


## Volatile Double Alkoxides of Lanthanons

By R. C. MEHROTRA\* and M. M. AGRAWAL

(*Chemical Laboratories, University of Rajasthan, Jaipur, India*)

ALKOXIDES of a number of lanthanide elements have been described in recent years<sup>1</sup> as crystalline solids which can be sublimed at comparatively high temperatures only in poor yields. We report here the preparation of some double alkoxides of lanthanum and praseodymium with aluminium by this simple reaction in isopropyl alcohol:



The lanthanon trichloride isopropyl alcoholate was prepared by dissolving the anhydrous chloride in dry isopropyl alcohol and potassium aluminium isopropoxide was obtained as a white solid soluble in isopropyl alcohol by the reaction of potassium and aluminium isopropoxides in equimolar quantities. Addition of isopropyl alcohol to a mixture of the above two solid reactants taken in a molar ratio of 1 : 3 gave a solution with slight turbidity, which gradually increased on refluxing the mixture for *ca.* 1 hr. The mixture was left overnight and

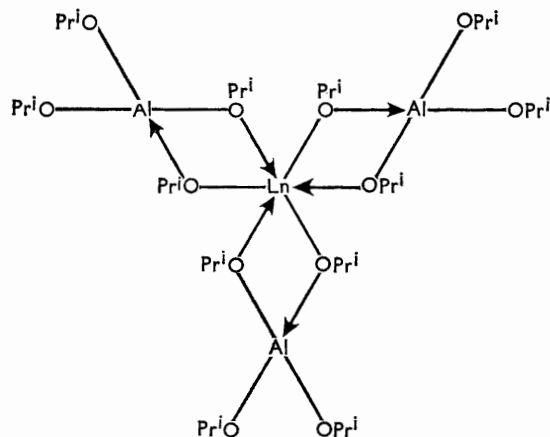
the potassium chloride was filtered off. On removing the filtrate of propan-2-ol under reduced pressure, white (lanthanum) and light green (praseodymium) crystalline solids were obtained. The analyses of the solids and molecular weights determined ebullioscopically in isopropyl alcohol corresponded to the formula  $M[Al(OPr^i)_4]_3$  (where M is La or Pr).

On heating under reduced pressure, the solids melted at a bath temperature of about  $100^\circ$ . Even at bath temperatures  $>200^\circ$ , there was no apparent signs of disproportionation [b.p. of  $Al(OPr^i)_3$  under 0.3–0.7 mm. is about  $92\text{--}98^\circ$ ] and finally viscous liquids distilled out almost in quantitative yields (b.p.'s of lanthanum and praseodymium compounds observed are  $208^\circ/0.7$  mm. and  $192^\circ/0.3$  mm. respectively).

An i.r. spectrum of  $La[Al(OPr^i)_4]_3$  in Nujol mull with KBr optics gave the following absorbances: 3325 mb, 2950 vs, 2915 vs, 2845 s, 2615 vw, 1460 s, 1375 s, 1166 s, 1130 s, 1030 m, 1000 vw, 952 m, 855 sh, 832 m, 814 sh, 692 mb, 670 mb, 604 w, 564 w, 530 w, 440 m.

In keeping with the structure of tetrameric

aluminium isopropoxides,<sup>2</sup> the following structure is tentatively suggested for these derivatives:



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<sup>1</sup> D. C. Bradley and M. M. Faktor, *Chem. and Ind.*, 1958, 1332; S. N. Misra, T. N. Misra, R. N. Kapoor, and R. C. Mehrotra, *ibid.*, 1963, 120; K. S. Mazdiyasi, C. T. Lynch, and J. S. Smith, *Inorg. Chem.*, 1965, 3, 525; B. S. Sankla, S. N. Misra, and R. N. Kapoor, *Chem. and Ind.*, 1965, 382; U. D. Tripathi, J. M. Batwara, and R. C. Mehrotra, *ibid.*, 1966, 1379; U. D. Tripathi, J. M. Batwara, and R. C. Mehrotra, *J. Chem. Soc.*, 1967, 991.

<sup>2</sup> V. J. Shiner, jun., D. Whittaker, and V. P. Fernandez, *J. Amer. Chem. Soc.*, 1963, 85, 2318.