

This article was downloaded by:

On: 29 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

### Synthesis and Investigation of Double Condensed Phosphates of Scandium and Alkali Metals

M. A. Avaliani<sup>a</sup>; I. V. Tananaev<sup>b</sup>; M. K. Gvelesiani<sup>a</sup>; V. N. Gaprindashvili<sup>a</sup>

<sup>a</sup> Institute of Inorganic Chemistry and Electrochemistry of the Georgian Academy of Sciences, Tbilisi, GSSR <sup>b</sup> N.S. Kurnakov Institute of General and Inorganic Chemistry Academy of Sciences of the USSR, Moscow, USSR

**To cite this Article** Avaliani, M. A. , Tananaev, I. V. , Gvelesiani, M. K. and Gaprindashvili, V. N.(1990) 'Synthesis and Investigation of Double Condensed Phosphates of Scandium and Alkali Metals', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 51: 1, 453

**To link to this Article:** DOI: 10.1080/10426509008040977

**URL:** <http://dx.doi.org/10.1080/10426509008040977>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## SYNTHESIS AND INVESTIGATION OF DOUBLE CONDENSED PHOSPHATES OF SCANDIUM AND ALKALI METALS

M.A.AVALIANI, I.V.TANANAEV<sup>a</sup>, M.K.GVELESIANI, and  
V.N.GAPRINDASHVILI

Institute of Inorganic Chemistry and Electrochemistry  
of the Georgian Academy of Sciences, Jikia Str. 7,  
380086 Tbilisi, GSSR

<sup>a</sup>N.S.Kurnakov Institute of General and Inorganic Chem-  
istry Academy of Sciences of the USSR, Lenin pr. 41,  
Moscow 117071, USSR

The present data are the result of experiments on synthesis and investigation of structure of an earlier unknown class of compounds: double condensed phosphates of scandium and alkali metals. The method of synthesis of double phosphates from solution-melts of phosphoric acids at 150-500°C was applied. At lower temperatures (150-240°C) double acid di-phosphates  $MSc(H_2P_2O_7)_2$  (where M - Li, Na, K) were crystallized. At 240-410°C depending on initial relationship of the components, a number of double compounds (triphosphates of sodium-scandium and potassium-scandium, polyphosphate  $[LiSc(PO_3)_4]_x$ , ultraphosphate  $Na_3ScP_8O_{23}$  and cyclophosphate  $K_2Sc_2P_8O_{24}$ ) was obtained. Double ultraphosphate of sodium-scandium belongs to a rare type of double compounds. Up to now only one ultraphosphate of sodium-iron was known. At 415-500°C double mediumdiphosphates  $MScP_2O_7$  were synthesized. Comparing the results of double phosphates of scandium, gallium, and indium with literary data, we conclude that condensed compounds of scandium, according to their composition and structure, coincide with phosphates of light trivalent metals (Ga, Fe, Cr, Al) and are not similar to corresponding compounds of rare earth elements.