

This article was downloaded by:

On: 28 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>

## Precipitation of Rare Earth Phosphates from $H_3PO_4$ Solutions

B. Zakharova<sup>ab</sup>, L. Komissarova<sup>ab</sup>, V. Traskin<sup>ab</sup>, S. Naumov<sup>ab</sup>, P. Melnikov<sup>ab</sup>

<sup>a</sup> Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow State University, Moscow, Russia <sup>b</sup> Institute of Chemistry, UNESP, Araraquara, SP, Brazil

**To cite this Article** Zakharova, B. , Komissarova, L. , Traskin, V. , Naumov, S. and Melnikov, P.(1996) 'Precipitation of Rare Earth Phosphates from  $H_3PO_4$  Solutions', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 111: 1, 2

**To link to this Article:** DOI: 10.1080/10426509608054631

**URL:** <http://dx.doi.org/10.1080/10426509608054631>

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.

## PRECIPITATION OF RARE EARTH PHOSPHATES FROM $H_3PO_4$ SOLUTIONS

B. Zakharova, L. Komissarova, V. Traskin, S. Naumov, P. Melnikov

Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Moscow  
State University, Moscow, 117234, Russia and Institute of Chemistry, UNESP, CP 355,  
Araraquara - 14800-900 - SP, Brazil

**Abstract** A study of several factors has been carried out in order to determine their influence on rare earth phosphates precipitation from  $H_3PO_4$  solutions obtained after the treatment of the Kola phosphate rock.

**Key Words:** *Lanthanides, Rare Earth Phosphates, Precipitation.*

Neutralization of  $H_3PO_4$  solutions obtained after phosphate rock treatment leads to the formation of colloidal systems which give rise to the poorly soluble rare earth (RE) phosphates. They represent predominantly the Ce group, Y and Sc[1]. A study of several factors (temperature, pH, presence of  $Ca^{2+}$ ,  $Al^{3+}$ ,  $Fe^{3+}$ ,  $F^-$ ,  $SiF_6^{2-}$ ) has been carried out in order to determine their influence on the properties of the phosphates precipitated as well as on the recovery of RE. Turbidimetric and electron microscopy techniques allowed the measurements of the particles sizes. The processes may be described by the equation:

$$dc/d\tau = -kc^2,$$

where  $c$  represents particle concentration at the moment  $\tau$ . It explains the prolonged time needed for decantation and the difficulties in the filtration processes. High temperatures stimulate faster aggregation of the particles. Several cations stabilize colloidal dispersions. In spite of the relatively large size of the particles the precipitation rate is low owing to the tendency of such systems for gel formation. The anions reduce the size of the particles considerably reducing RE extraction from the acid. In contrast, at lower pH the average particle size grows and pH = 2 allows the precipitation of the RE up to 90%. Sc and Y recoveries are much inferior, 45 and 29% respectively.

### REFERENCE

1. B. Zakharova, L. Komissarova, S. Naumov, V. Traskin, S. Naumov, *Inorg. Mater.*, 2(1992)1738

Acknowledgments: CNPq, FAPESP