

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>

Synthesis and Characterization of Na And Mg Containing Carbonatefluorapatites

Merike Peld^a; Kala Tõnsuaadu^a; Mihkel Veiderma^a

^a Tallinn Technical University, Tallinn, Estonia

To cite this Article Peld, Merike , Tõnsuaadu, Kala and Veiderma, Mihkel(1996) 'Synthesis and Characterization of Na And Mg Containing Carbonatefluorapatites', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 111: 1, 5

To link to this Article: DOI: 10.1080/10426509608054634

URL: <http://dx.doi.org/10.1080/10426509608054634>

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 CHARACTERIZATION OF Na AND Mg CONTAINING CARBONATEFLUORAPATITES

MERIKE PELD, KAIA TÕNSUAADU, MIHKEL VEIDERMA
Tallinn Technical University, Tallinn, Estonia, EE0026

The apatites were precipitated in an aqueous $\text{NH}_4\text{OH-NH}_4\text{NO}_3$ solution with pH 9-10 at temperatures 20°C and 80°C. The synthesized materials were studied by chemical and thermal analyses (TG/DTG/DTA, TG/FTIR-EGA), IR-spectroscopy, XRD-powder analysis and specific area measurements.

The precipitated materials are poorly crystallized carbonatefluorapatites (CFAp) with a large specific area. Their chemical composition can be expressed with the general formula $\text{Ca}_a\text{Mg}_b\text{X}_c(\text{HPO}_4)_x(\text{PO}_4)_{6-x-d}(\text{CO}_3)_d\text{F}_{2-y}(\text{OH})_y \cdot n\text{H}_2\text{O}$, where X is Na^+ or NH_4^+ and $a=4-10$, $b=0-5$, $c(\text{Na}^+)=0,2-0,4$, $c(\text{NH}_4^+)=0-0,9$ and $d=0,05-0,75$. A higher temperature of precipitation diminishes the content of CO_3^{2-} and NH_4^+ ions in the product. Sodium stabilizes the structure of CFAP and avoids the introduction of NH_4^+ ions into the apatite structure.

On heating water evolves stepwise at the temperatures up to 500°C and ammonia in the temperature range 100-400°C, followed by the appearance of P-O-P bonds. Carbon dioxide evolves in a wide temperature range from 100°C up to 800-1000°C. The heating products consist of well-crystallized CO_3^{2-} free apatite.