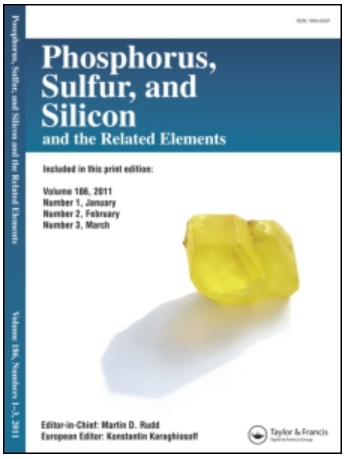

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Study of Fluoroapatite Reactions: The Effect of Metaphosphate Melts on Fluorine-Containing Substances

H. Valdsaar[a]
[a] C&P Department, Jackson Laboratory, Chambers Works, E.I. du Pont de Nemours & Co., Inc., Deepwater, NJ, USA

To cite this Article Valdsaar, H.(1990) 'Study of Fluoroapatite Reactions: The Effect of Metaphosphate Melts on Fluorine-Containing Substances', Phosphorus, Sulfur, and Silicon and the Related Elements, 51: 1, 440
To link to this Article: DOI: 10.1080/10426509008040964
URL: http://dx.doi.org/10.1080/10426509008040964

Phosphorus, Sulfur, and Silicon, 1990, Vols. 51/52, p. 440
Reprints available directly from the publisher
Photocopying permitted by license only

STUDY OF FLUOROAPATITE REACTIONS: THE EFFECT OF METAPHOSPHATE MELTS ON FLUORINE-CONTAINING SUBSTANCES

H.VALDSAAR
E.I. du Pont de Nemours & Co., Inc.,
C&P Department, Jackson Laboratory, Chambers Works
Deepwater, NJ 08023 USA

The interaction of metaphosphate melts with fluorine-containing substances was studied. The major variables were composition and temperature. Sodium metaphosphate in contact with fluorides or fluoroapatite gives rise to reactions above 550°C, which liberate fluorine in the form of volatile compounds, mostly as hydrogen fluoride. At least one gas containing phosphorus and fluorine is released from the melt. Evidence points to phosporyl trifluoride (POF_3). The relative amount of HF to POF_3 depends on the concentration of combined hydrogen in the melt and water vapor in the atmosphere above the melt. The rate of the removal of the gaseous reaction products is markedly affected by the depth of the layer through which they have to diffuse. The interaction of metaphosphate melts with fluorides is a general reaction independent of the type of fluoride, and produces the same major products in the gaseous phase. Calcium ions are more effective in furthering the gas evolution from the melt than sodium ions. The structure of synthetic fluoroapatite is destroyed by sodium metaphosphate above 550°C, and under certain conditions the fluorine content of the sample is reduced by 80% within an hour. The yield in the fluorine-containing gases shows a maximum at about 640°C.