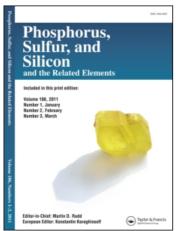
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STUDY OF FLUOROAPATITE REACTIONS: THE EFFECT OF META-PHOSPHATE MELTS ON FLUORINE-CONTAINING SUBSTANCES

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The interaction of metaphosphate melts with fluorinecontaining substances was studied. The major variables were composition and temperature. Sodium metaphosphate in contact with fluorides or fluoroapatite gives rise reactions above 550°C, which liberate fluorine in the form of volatile compounds, mostly as hydrogen fluoride. containing phosphorus one gas and fluorine Evidence points released from the melt. to phosporyl trifluoride (POF₃). The relative amount of 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 а general 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.