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

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## Mcrowave-Assisted Rapid Solid-State Chemistry of Phosphate Materials

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## MICROWAVE-ASSISTED RAPID SOLID-STATE CHEMISTRY OF PHOSPHATE MATERIALS

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**Abstract** The present work reports some applications of microwave processing in the synthesis of inorganic condensed phosphates.

**Key words:** microwave technique, phosphates

The efficient and specific coupling of microwave radiation to chemicals in solution and in the solid state was recently reported [1]. No data concerned phosphate materials have been known.

To simplest order, one would expect advantages for microwave synthesis over conventional synthesis similar to the advantages of microwave food processing over conventional oven cooking: the rapidity and the economy. Table 1 summarizes some first results concerned with microwave-induced synthesis of condensed phosphates starting from hydrogen phosphates.

TABLE 1 Microwave-induced transformations of solid hydrogen phosphates.

Compound	Time, min.	Product
$\text{Al}(\text{H}_2\text{PO}_4)_3\text{-C}$	5	$\text{Al}(\text{PO}_3)_3$
$\text{Al}(\text{H}_2\text{PO}_4)_3\text{-C} + \text{KH}_2\text{PO}_4$	5	$\text{KAIP}_2\text{O}_7$
$\text{Al}(\text{H}_2\text{PO}_4)_3\text{-C} + 2\text{KH}_2\text{PO}_4$	5	$\text{KAIHP}_3\text{O}_{10}$
$\alpha\text{-Zr}(\text{HPO}_4)_2\text{H}_2\text{O}$	15	$\text{ZrP}_2\text{O}_7$

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