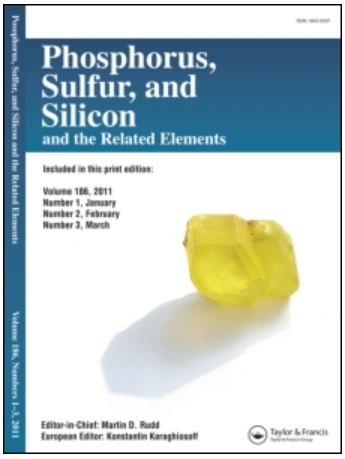

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Hydrolytic Property of Imidodiphosphate in Solid and an Aqueous Solution

M. Watanabe[a]
[a] Department of Industrial Chemistry, Chubu University, Kasugai, Aichi, Japan

To cite this Article Watanabe, M.(1990) 'Hydrolytic Property of Imidodiphosphate in Solid and an Aqueous Solution', Phosphorus, Sulfur, and Silicon and the Related Elements, 51: 1, 473
To link to this Article: DOI: 10.1080/10426509008040997
URL: http://dx.doi.org/10.1080/10426509008040997

Phosphorus, Sulfur, and Silicon, 1990, Vols. 51/52, p. 473
Reprints available directly from the publisher
Photocopying permitted by license only

HYDROLYTIC PROPERTY OF IMIDODIPHOSPHATE IN SOLID AND AN AQUEOUS SOLUTION

M.WATANABE
Department of Industrial Chemistry, Chubu University,
Matsumoto-cho, Kasugai, Aichi 487 Japan

Sodium imidodiphosphate decahydrate was made by using phosphoryl chloride as a starting material. When the imidodiphosphate decahydrate was stirred in ethanol for two days at room temperature, most of the water of crystallization was removed and amorphous sodium imidodiphosphate was prepared without decomposition.

When sodium imidodiphosphate decahydrate was heated at about 200°C, it was dehydrated to anhydrous sodium imidodiphosphate. During the heating, a small part of the imidodiphosphate was decomposed to amido-, ortho-, and diphosphates at the same time. Upon heating amorphous sodium imidodiphosphate above 200°C in air, most of it was directly converted to diphosphate without taking a process of dehydration polymerization of orthophosphate which can be made by the decomposition of the imidodiphosphate. The following reaction can be written for the process:

$$Na_2O_3PNHPO_3Na_2 + H_2O \longrightarrow Na_2O_3POPO_3Na_2 + NH_3$$

The water in the equation can some from that remained in the imidodiphosphate and/or in air. At the same time, a small part of the amorphous imidodiphosphate was decomposed to amido- and orthophosphates. Imidodiphosphate was hydrolyzed to amido- and orthophosphates in an aqueous solution as follows:

$$Na_2O_3PNHPO_3Na_2 + H_2O \longrightarrow Na_2PO_3NH_2 + Na_2HPO_4$$