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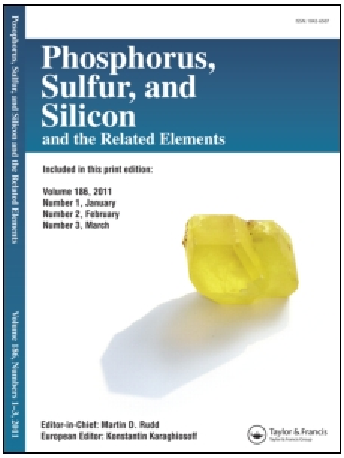

Phosphorus, Sulfur, and Silicon and the Related Elements

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Halogenophosphonic and Halogenophosphinic Acids

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HALOGENOPHOSPHONIC AND HALOGENOPHOSPHINIC ACIDS

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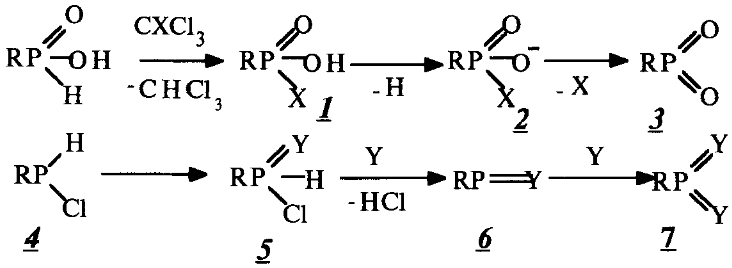
Methods for the synthesis and preparations of first stable halogenophosphonic acids 1 (X=Cl, Br) and halogenophosphinic acids 5 (Y = O, S) are developed. The chemical properties of the compounds 1, 4, 5 are studied



The compounds 1, 5 are stable, when they contain sterical hindered substituents R =Mes*, t-Bu. Tert-butylhalogenophosphonic acids 1 with triethylamine forms rather stable salts 2, which on heating eliminate triethylamine hydrohalogenide to afford trimer of tert-butyldioxaphosphorane. Flesh-vacuum thermolysis (FVT) (600° C, p= 0.01 mm Hg) of trimethylsilyl tert-butylhalogenophosphonates proceeds with elimination of halogenotrimethylsilane to give very unstable tert-butyldioxophosphorane, which readily transforms into trimer. Bis-oxaphosphoranes undergo the reaction of [2+3]-cycloaddition with epoxides to give 1,3,2-dioxaphosphol-2-oxides.

Monochlorophosphines 4 oxidizes or add sulfur with formation of chlorophosphinic acids 5 (Y=O, S), which may be dehydrochlorinated with formation unstable 6. The latter adds sulfur to give 7 isolable in high yield.

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