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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>

Destruction of Toxic Organophosphorus Esters by Oxidative α -Nucleophilic Reagent

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To cite this Article Cristau, H. -J. , Torrelles, E. , Cussagne, T. , Lion, C. , Desgranges, M. , Magnaud, G. and Delmas, G.(1996) 'Destruction of Toxic Organophosphorus Esters by Oxidative α -Nucleophilic Reagent', Phosphorus, Sulfur, and Silicon and the Related Elements, 111: 1, 129

To link to this Article: DOI: 10.1080/10426509608054758

URL: <http://dx.doi.org/10.1080/10426509608054758>

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DESTRUCTION OF TOXIC ORGANOPHOSPHORUS ESTERS BY OXIDATIVE α NUCLEOPHILIC REAGENT

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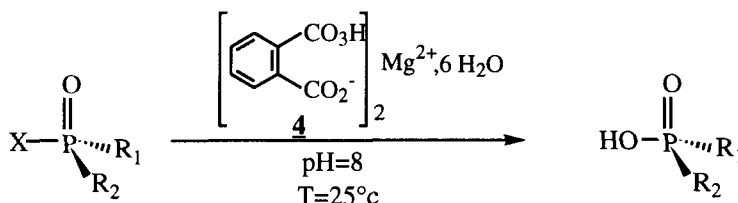
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Abstract Despite its self-decomposition, Magnesium MonoPeroxyPhthalate **4** is an excellent reagent to totally detoxify phosphonothiolate **1** and fluoridate **2** in basic aqueous medium.

Decontamination of toxic organophosphorus¹ compounds in mild conditions presents an important challenge, MMPP **4** is an effective oxidative α nucleophilic reagent in basic aqueous medium. At pH=8, with 50 % peroxyanions forms, its self decomposition rate is important ($\tau_{1/2}$ =8 min.).

With 10 eq. of MMPP **4**, phosphonothiolate **1** and fluoridate **2** are totally detoxified by splitting the P-S and P-F bonds in a short time (20 min. and 40 min.). P-O bond (phosphate ester **3**) is less reactive than P-S and P-F, so decontamination is incomplete (40 %).



	R ₁	R ₂	X
1	CH ₃	O-Et	S-CH ₂ -CH ₂ -N(iPr) ₂
2	CH ₃	O-CH(CH ₃)-tBu	F
3	O-Et	O-Et	O-C ₆ H ₄ -NO ₂

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