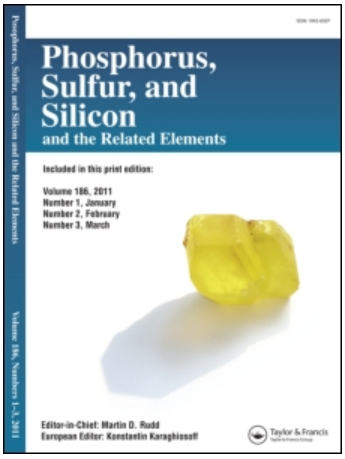

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Synthesis and Properties of Some Polyfunctional Organophosphorus Compounds

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To cite this Article Mukmeneva, N. A. , Khazanovskaya, M. M. , Cherasova, O. A. and Kirov, S. M.(1990) 'Synthesis and Properties of Some Polyfunctional Organophosphorus Compounds', Phosphorus, Sulfur, and Silicon and the Related Elements, 51: 1, 188
To link to this Article: DOI: 10.1080/10426509008040722
URL: http://dx.doi.org/10.1080/10426509008040722

Phosphorus, Sulfur, and Silicon, 1990, Vols. 51/52, p. 188
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SYNTHESIS AND PROPERTIES OF SOME POLYFUNCTIONAL ORGANOPHOSPHORUS COMPOUNDS

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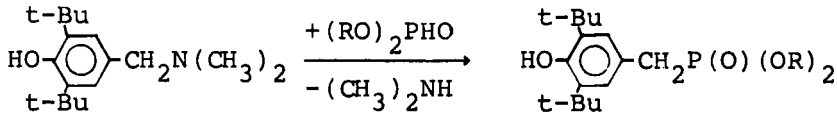
A series of cyclic and acyclic 3,5-di-tert-butyl-4--hydroxybenzyl phosphonates (I) has been synthesized:



I

The obtained compounds are soluble in chloroform and methanol, less in benzene, and only on heating in hexane, heptane and carbon tetrachloride. Their thermal stability increases with the size of alkyl (aryl) or alkylene (arylene) groups. Alkali hydrolysis of phosphonates I results in the formation of 3,5-di-tert-butyl-4-hydroxybenzyl phosphonic acid (R = H).

Due to several potential reaction centres in the molecule (labile hydrogen atoms in the α-methylene fragment, the sterically hindered hydroxyl group, heteroatoms) phosphonates I are active both in homo- and heterolytic reactions. Thus, dialkyl 3,5-di-tert.-butyl-4-hydroxybenzyl phosphonates have been shown to reveal the high inhibiting effect in the processes of hydrocarbon oxidation (methods of chemiluminiscence and ot the initiated oxidation of styrene, 50-60°C, $k_7 = 1 \cdot 10^4 - 1 \cdot 10^6$ l/mole·sec, f = 1-2) and the high reactivity toward cumene hydroperoxide (method of polarography, 100°C, chlorobenzene, $\nu = 1 - 1 \cdot 10^4$). Oxidation of phosphonates I with lead dioxide affords energy and constants of the superfine interaction have been determined.