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Oxidative Phosphonylation of Aromatic Compounds

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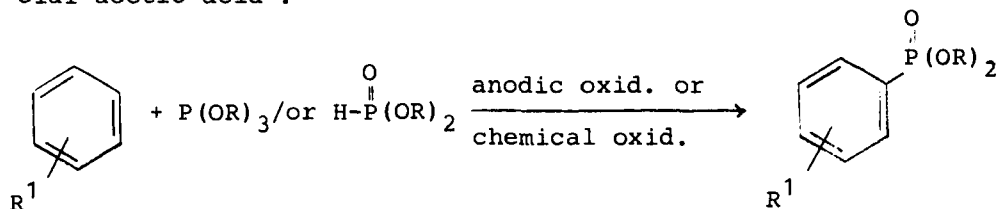
Oxidative Phosphonylation of Aromatic Compounds

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Aryl phosphonates can be prepared in good yields from the respective arenes and tri- or dialkylphosphites by either chemical or electrochemical oxidation¹. The anodic oxidation proceeds either via phosphonium radical cations which then attack the arenes electrophilically or via arene radical cations which add the trialkylphosphite as nucleophile^{1,2}. Aryl phosphonates are also obtained in good yields by chemical oxidation with peroxodisulfate/AgNO₃, Iron(III)- or Cerium(IV)-complexes in acetonitrile/water or glacial acetic acid³.



The diethylphosphinium radical cation, formed from diethylphosphite by oxidation with Ag²⁺, Fe³⁺, or Ce⁴⁺, is supposed to be the reactive species in these processes. Selectivity ratios and kinetic data were determined for the oxidative phosphonylation process.

1. F. Effenberger, H. Kottmann, *Tetrahedron* **41**, 4171 (1985).

2. F. Effenberger, Th. Beck, H. Kottmann, unpubl. results.

3. H. Kottmann, J. Skarzewski, F. Effenberger, *Synthesis*, in press.