

ABSTRACT

A general alternative synthetic route to diiodoperfluoroalkylphosphines was developed by means of investigations into the synthesis of perfluoroethylene-bridged diphosphines. The reaction of diphosphorus tetraiodide and perfluoroalkyl iodides in anhydrous benzonitrile at 150°C leads to the formation of diiodoperfluoroalkylphosphines which can be oxidatively hydrolyzed to produce the perfluoroalkylphosphonic acids. A new perfluoroethylene-bridged diphosphine, tetrafluoroethyl-1, 2-diphosphonous diiodide, $\text{I}_2\text{PCF}_2\text{CF}_2\text{PI}_2$ has been synthesized as a precursor to the perfluoroethylene-1, 2-bisphosphonic acid in addition to iodotetrafluoroethylphosphorus (III) diiodide and its acid derivative, 2-iodotetrafluoroethylphosphonic acid.

Keywords: diiodoperfluoroalkylphosphines; perfluoroalkylphosphonic acids; oxidative hydrolysis; perfluoro-ethylene-1, 2-bisphosphonic acid.