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 150ºC 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.