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# A 3D Metal-Organic Framework with a pcu Net Constructed from Lead(II) and Thiophene-2, 5-dicarboxylic Acid: Synthesis, Structure and Ferroelectric Property

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## Abstract

Self-assembly reaction of  $\text{Pb}(\text{NO}_3)_2$  with thiophene-2, 5-dicarboxylic acid ( $\text{H}_2\text{TDC}$ ) led to an acentric three-dimensional (3D) metal-organic framework under solvothermal conditions, namely,  $\text{Pb}(\text{TDC})$  (**1**). The 3D framework of **1** is a pillared-layer structure with the  $\text{I}^2\text{O}'$  type which is composed of a 2D inorganic  $\text{Pb-O-Pb}$  substructural layer and two independent  $\mu_6\text{-TDC}^{2-}$  anions pillars. This 3D framework shows a six-connected **pcu** topological net according to the topological analysis. Compound **1** crystallizes in an acentric space group and displays potential ferroelectric property which could be due to the swing of the thiophene rings. The

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