

Synthesis and structure of a silver complex $[p\text{-Tol}_4\text{P}]^+_3[\text{Ag}_3\text{I}_6]^{3-}$

© Vladimir V. Sharutin,^{1*} Vladislav S. Senchurin,¹
Anastasia N. Neudachina,¹ and Nikolai V. Somov²

¹ Department of Organic Chemistry. Chemistry Faculty. South Ural State University.

Lenin St., 76. Chelyabinsk, 454080. Russia. Phone: +7 (351) 267-95-70. E-mail: vvsharutin@rambler.ru

² Physical Faculty, Nizhny Novgorod State University. Gagarin St., 23. Nizhny Novgorod, 603950. Russia.

*Supervising author; ⁺Corresponding author

Keywords: reaction, tetra-*para*-tolylphosphonium iodide, silver iodide, dimethylsulfoxide, complex, $[p\text{-Tol}_4\text{P}]^+_3[\text{Ag}_3\text{I}_6]^{3-}$, structure.

Abstract

By the reaction of tetra-*para*-tolylphosphonium iodide with silver iodide in dimethylsulfoxide we synthesized silver ionic complex $[p\text{-Tol}_4\text{P}]^+_3[\text{Ag}_3\text{I}_6]^{3-}$. According to X-ray analysis, this complex is composed of tetra-*para*-tolylphosphonium cations and trinuclear silver anions. Phosphorus atoms have a tetragonal coordination (CPC 106.6(4)°-110.3(2)°, C-P 1.782(5)-1.802(5) Å), terminal silver atoms in the anion $[\text{Ag}_3\text{I}_6]^{3-}$ are three-coordinated (Ag-I 2.653 (2)-2.8032(12) Å), central silver atom is bound with the terminal atoms of silver through four atom bridge I and has a coordination number 4 (Ag-I 2.9014(14)-2.9049(15) Å). The angle between the planes of two rhombic fragments Ag_2I_2 [AgIAg 77.60(4)°], connected in whole through the central silver atom in anions makes up 59.53°.