(Phenylethynyl)trimethylphosphonium Bromide and Bromoaurates(I)

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(Phenylethynyl)trimethylphosphonium bromide (1) has been reinvestigated by NMR spectroscopy and its crystal structure determined. In the monoclinic crystals, the cations are arranged in layers in the *a*-*c* planes, with their P-C=C-Ph axes parallel within one layer, but alternating in consecutive layers. The bromide anions are accommodated in channels between the cations. The spectroscopic and structural results are in agreement with the special reactivity pattern documented for ethynylphosphonium salts, in particular with the sensitivity to nucleophiles which *e. g.* prevents standard ylide formation. A slurry of polymeric phenylethynylgold [PhC=CAu]_n in dichloromethane reacts with [Me₃PC=CPh]Br to give a clear solution of [Me₃PC=CPh]⁺ [PhC=CAuBr]⁻ (2). In a similar reaction, with soluble pentafluorophenylgold(tetrahydrothiophene), C₆F₅Au(tht), the salt [Me₃PC=CPh]⁺ [C₆F₅AuBr]⁻ (3) is produced. All attempts to generate gold(I) complexes of the corresponding phosphonium ylide [Me₂(PhC=C)P=CH₂] by treatment of the two phosphonium salts (2, 3) with strong base were not successful owing to side reactions induced by base.

Key words: Ethynylphosphonium Salts, Phosphonium Salts, Bromoaurates(I), Aurates(I)