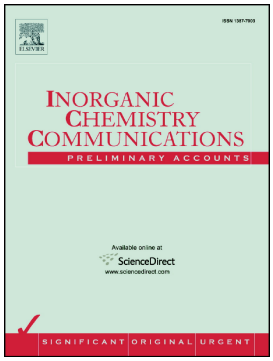

N,C,N-chelated antimony(III), bismuth(III) and tin(IV) derivatives of 1,1′-ferrocenedicarboxylic acid

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N,C,N-chelated Antimony(III), Bismuth(III) and Tin(IV) Derivatives of 1,1´-Ferrocenedicarboxylic Acid.

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Abstract

*N,C,N-intramolecularly coordinated antimony(III) and bismuth(III) oxides $(ArMO)_2$ [where Ar = $[2,6\text{-}(Me_2NCH_2)_2C_6H_3]^-$, M = Sb (**1**) or Bi (**2**)] reacted with 1,1´-ferrocenedicarboxylic acid $fc(COOH)_2$ (fc = ferrocene-1,1´-diyl) under formation of corresponding carboxylates $fc(COO)_2SbAr$ (**4**) and $[fc(COO)_2BiAr]_2$ (**5**). Similarly, the treatment of $fc(COOH)_2$ with tin(IV) carbonate $ArSnPhCO_3$ (**3**) led to the carboxylate $fc(COO)_2Sn(Ph)Ar$ (**6**). All compounds were characterized by the help of multinuclear NMR, Raman, IR and UV-Vis spectroscopy and in the case of **4** and **5** using single-crystal X-ray diffraction analysis.*

The utilization of carboxylates as ligands in main group chemistry is unexceptional. Carboxylates derived from ferrocene constitute a special class of compounds. Especially the easily available 1,1´-ferrocenedicarboxylic acid provides a rich spectrum of coordination modes, thus being a promising ligand and(or) template for building of various types of carboxylates.[1] This field of chemistry is quite well studied in the case of organotin(IV) compounds, where both 1,1´-ferrocenedicarboxylic and also various mono-functionalized ferrocenecarboxylic acids were applied.[2] Surprisingly, very limited number of related structurally characterized carboxylates is known for the antimony and bismuth. In fact, the structure of only two antimony(V) compounds, *i.e.* $Fc(COO)SbPh_4$ and $[Fc(COO)]_2Sb(p\text{-}tolyl)_3$, (Fc = ferrocenyl) were reported by Liu *et al*.[3] Only recently, Chandrasekhar used both ferrocene mono- and 1,1´-dicarboxylic acid in the reaction with Ph_3Bi leading to the formation of interesting coordination polymers.[4] Above mentioned facts inspired us to enrich the chemistry of heavier pnictogen ferrocene-based carboxylates by using the 1,1´-ferrocenedicarboxylic acid as a reagent for our antimony(III) [5] and bismuth(III) [6] oxides $(ArMO)_2$ [where Ar = $[2,6\text{-}(Me_2NCH_2)_2C_6H_3]^-$, M = Sb (**1**) or Bi (**2**)]. These oxides showed an interesting reactivity toward acidic oxides (such as SeO_2, CO_2, SO_2, As_2O_3 etc.) [7] and