Benzyldimethylalkylammonium Haloplumbates: Organic/inorganic Composite Materials

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In due course of investigations of the relationships between sorption properties of benzylalkylammonium cations and their behaviour in the crystalline phases (the way of packing and the type of interactions), benzyldimethyl-n-alkylammonium haloplumbates(II) with n = 2 - 6 and 9 - 10 were tailored.

In recent years the chemistry of transition metal complexes has been developed towards the construction of different (unusual) structural models in order to rationalize the correlations between structure and physical properties. Halometallates(II) represent interesting systems for designing low-dimensional architecture with specific electronic, thermal, electrical, magnetic and polymorphic properties. Haloplumbates(II) form a particular class of these materials because the flexibility of Pb(II) coordination sphere and non-stereospecific nature of the halide anions. As mixed organic/inorganic materials benzyldimethyl-n-alkylammonium haloplumbates(II) combine properties typical for organic molecular crystals with those associated to inorganic solids. The crystal structures of several benzyldimethyl-n-alkylammonium haloplumbates(II) were determined by X-ray diffraction showing one-dimensional linear chains built of -[$PbBr_3$]n- mers. The studied structures could easily be modified by the size of ammonium cations, their packing properties and an ability to form weak hydrogen bond systems of C-H...π and C-H...X (X = halogene atom) type.

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