Accessing one-dimensional chains of halogenoindates(III) in organic–inorganic hybrids.

Autorzy

Magdalena Owczarek

Minseong Lee

Vivien Zapf

Wanyi Nie

Ryszard Jakubas

Rok wydania

2022

Czasopismo

Inorganic Chemistry

Numer woluminu

61

Strony

5469-5473

DOI

10.1021/acs.inorgchem.2c00374

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Organic−inorganic hybrids of halogenoindates(III) are typically represented by one of the zero-dimensional units: InX_4^-, InX_5^{2-}, InX_6^{3-}, or $In_2X_{11}^{5-}$. Higher dimensional anionic forms, although not forbidden, have remained almost elusive. Here we report for the first time In^{3+}-based organic–inorganic hybrids, $(C_4H_5N_2S)_2InCl_5$ and $(C_4H_5N_2S)_2InBr_5$, with 1D anionic chains o f *trans*-halide-bridged InX_6 octahedra whose formation is guided by 2-mercaptopyrimidinium cations ($C_4H_5N_2S^+$). The chains are characterized by the significant ease of deformation, which is reflected in the elongation of the bridging bonds or the displacement of In^{3+} ions. The materials show a robust band gap predominantly governed by $C_4H_5N_2S^+$ cations. Dielectric relaxation processes in $(C_4H_5N_2S)_2InBr_5$ arise from the cations' dynamics and suggest the ability of the brominated system to accommodate even larger cations. Our work represents a successful attempt to expand the structural diversity of halogenoindates(III) and opens a pathway to reach multifunctional 1D In^{3+}-based hybrids.

Słowa kluczowe

Crystals, Oligomers, deformation, Electrical conductivity, cations

Adres publiczny

http://dx.doi.org/10.1021/acs.inorgchem.2c00374

Strona internetowa wydawcy

https://www.acs.org/content/acs/en.html