

Preparation and Characterization of $[\text{C}_6\text{H}_5\text{CH}_2\text{NH}_3]_2\text{PbI}_4$, $[\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{SC}(\text{NH}_2)_2]_3\text{PbI}_5$ and $[\text{C}_{10}\text{H}_7\text{CH}_2\text{NH}_3]\text{PbI}_3$ Organic-Inorganic Hybrid Compounds

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Z. Naturforsch. **54 b**, 1405–1409 (1999); received July 7, 1999

Organic-Inorganic Hybrids, Perovskites, Low-Dimensional Compounds, Excitonic Spectra

The preparation, crystal structures, optical absorption spectra, and photoluminescence spectra of the title compounds are reported. The compounds were prepared in single crystal form. $[\text{C}_6\text{H}_5\text{CH}_2\text{NH}_3]_2\text{PbI}_4$ consists of anionic perovskite sheets of corner-sharing PbI_6 octahedra, which alternate with the $\text{C}_6\text{H}_5\text{CH}_2\text{NH}_3^+$ sheets. $[\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{SC}(\text{NH}_2)_2]_3\text{PbI}_5$ consists of zig-zag chains of anionic corner sharing PbI_6 octahedra separated by $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{SC}(\text{NH}_2)_2$ cations. $[\text{C}_{10}\text{H}_7\text{CH}_2\text{NH}_3]\text{PbI}_3$ consists of twin chains of edge-sharing PbI_6 octahedra separated by $\text{C}_{10}\text{H}_7\text{CH}_2\text{NH}_3$ cations. The compounds are thus low-dimensional systems. The excitonic spectra were observed in all cases, even at room temperature, and the possibility of organic-inorganic excitonic interactions is discussed.