Influence Of Hydrogen Bonding on The Formation Of 0D Or 1D Manganese-Halide Hybrid Materials

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In recent years metal-halide hybrid materials attracted much attention because materials such as lead-iodide perovskites can have excellent properties as photovoltaics. Manganese- halide materials have been much less studied in comparison to their lead counterpart; however they are interesting as manganese can have different oxidation states and coordination modes. The versatility of manganese gives the opportunity to apply these materials into LEDs, X-ray detectors, and magnetic materials. Recently we synthesized four different manganese chloride or bromide materials with either 3-aminopyridine (3-AP) or 4- ethyl-pyridine (4-EtP). Two isomorphic complexes with 3-AP and manganese chloride (**[$MnCl_2$(3-AP)$_4$]**) or manganese bromide (**[$MnBr_2$(3-AP)$_4$]**) were obtained with the amino group in 3-AP assisting the formation of 0D structures via hydrogen bonding. Unlike 3-AP, 4- EtP does not provide the opportunity for hydrogen bonding leading to the formation of individual 1D chains with manganese chloride (**{$MnCl_2$-4-EtP}$_n$**) and manganese bromide (**{$MnBr_2$-4-EtP}$_n$**), which are isomorphic structures as well. In the visible region, the four manganese halide compounds share similar photoluminescence. In conclusion, hydrogen bonding groups can play a role in the formation of discrete manganese-halide units, or 1D manganese halide chains.

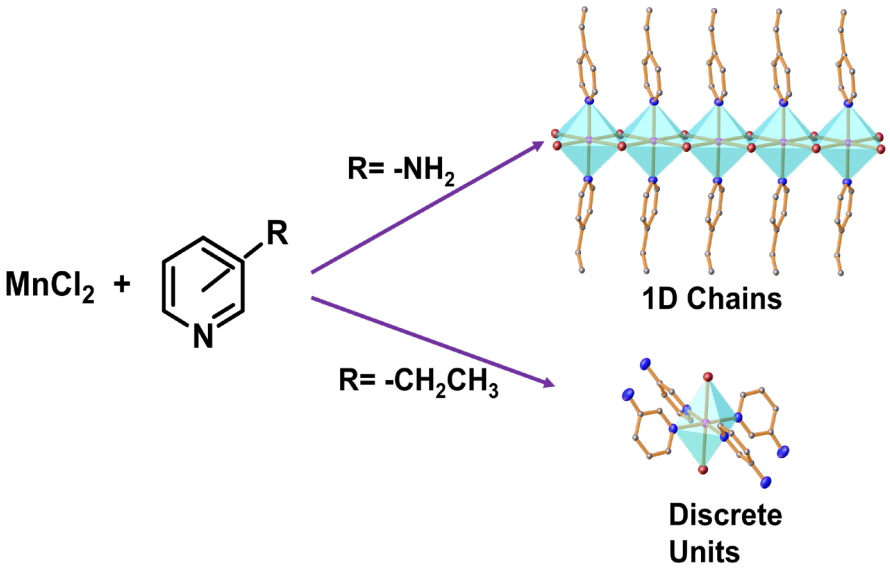

Figure 1