MS31 Unconventional interactions or symmetries for optimized and new properties, including chirality

MS31-01
Anion-Anion Self-assembly via Matere Bond and other σ-Hole Interactions
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Abstract
Several attractive interactions can effectively balance the coulombic repulsion between ions with the same charge and, for instance, can allow for the self-assembly of anions into stable adducts. An example is the hydrogen bond (HB) that can drive the formation of anion-anion dimers stable in the gas, liquid, and solid phases thanks to the force localized in the region of the HB between two protic hydroxyanions (e.g., HCO_3^-, HSO_4^-, and $H_2PO_4^-$).
The anisotropic distribution of the electron density in the anion, namely the formation of a pnictogen bond (PnB), has been used to rationalize the formation of adducts involving polyatomic anions of group 15 elements [1]. An analogous approach will be presented in this lecture in order to rationalize the self-assembly of polyatomic anions wherein the central atom of the polyatomic anion is an element of group 7 or 11 of the Periodic Table. Specifically, it will be described how the matere bond (MaB) can drive the organization of permanganate and perrhenate anions into dimers and infinite chains [2] and how tetrachlorido aurate anions self-assemble into infinite chains under coinage bond (CiB) control [3].

References
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