

ABSTRACT SYMPOSIUM NAME: ACS Award for Creative Research and Applications of Iodine Chemistry:
Symposium in Honor of Karl O. Christe - Invited - Oral

ABSTRACT SYMPOSIUM PROGRAM AREA NAME: [FLUO] Division of Fluorine Chemistry

CONTROL ID: 2081089

PRESENTATION TYPE: Oral Only : Do not consider for Sci-Mix

TITLE: Iodine driven self-assembly processes

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ABSTRACT BODY:

Abstract: The distribution of electron density around covalently bound atoms is asymmetric. This asymmetry is responsible for the elliptical shape of monovalent halogens where the larger, and smaller, radius are associated with the regions of higher, and lower, electron density, respectively. The lower electron density area typically forms a positive cap on the elongation of the covalent bond and this area is particularly large and shows a particularly positive electrostatic potential in iodine compounds as a consequence of the high polarizability of this element. This area attractively interacts with electron rich sites, e.g. lone pair possessing atoms and anions, to form the so named halogen bond. In this lecture we will show how iodine based halogen bonds are a very effective tool in crystal engineering and self-assembly processes as 0D, 1D, 2D, and 3D adducts can be designed and formed with a high degree of accuracy. We will also show how the interaction is remarkably effective in controlling and tuning the structure and the functional properties of molecular materials. For instance, we will show the obtainment of self-assembled and fluorinated liquid crystal, supramolecular gelators, light responsive supramolecular polymers.

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