Charging Carbon Bowls and Belts with Multiple Electrons: Self-Assembly and Metal Binding Trends

Abstract: Bowl-shaped polyaromatic hydrocarbons represent a unique and novel class of carbon-rich polyarenes in which the convex and concave faces exhibit different chemical and physical properties. These curved polyarenes map onto the surfaces of fullerenes but lack their full closure, and therefore are often referred to as carbon π-bowls or fullerene fragments. Systematic investigation of their structures, properties and reactivity is a new area of research rapidly growing in the last two decades. Carbon bowls serve as excellent reservoirs for multi-electron uptake. Their controlled stepwise reduction followed by the isolation of solid products has been accomplished in our group. We revealed the formation of remarkable supramolecular aggregates with high degree of lithium encapsulation between the negatively charged π-decks as well as synergism of mixed alkali metal systems in reduction processes, establishing a new paradigm for alkali metal intercalation in novel non-planar carbon hosts.

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Cram Conference Room, 3440 Mol Sci
4:30 pm