

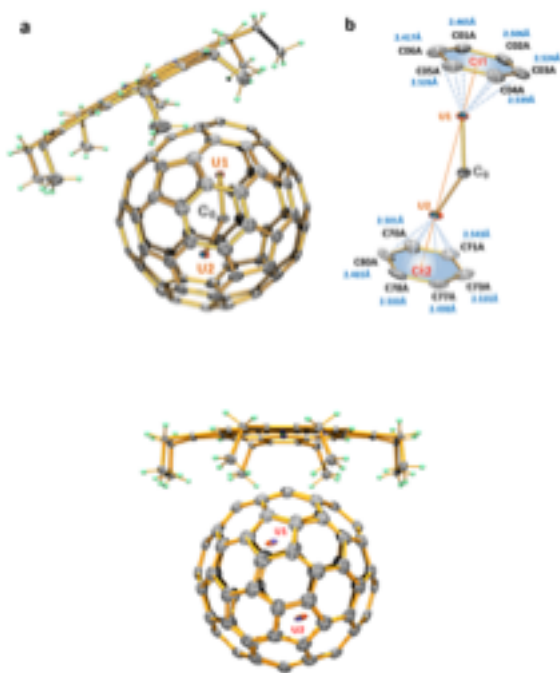
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ORGANIC SYNTHESSES
Seminar Speaker

Wednesday, February 5, 2020
Tiernan Hall, Lecture Hall I
1:00 P.M.
Light Refreshments



Buckyball Maracas: Fullerene Nanocontainers that Stabilize Unusual Atoms and Clusters Inside



For the past two years we have been involved in the synthesis and characterization of new Uranium-based endohedral fullerenes and have obtained X-Ray crystal structures for several of these compounds. Some are mono-uranium species, $U@C_{2n}$, while some are di-uranium compounds, $U_2@C_{2n}$.¹ Very recently we isolated two new mono-uranium compounds that violate the Isolated Pentagon Rule (IPR) with a C_{76} and a C_{80} cage possessing fused five-membered rings (pentalenes) on their surfaces.² Still other endohedral structures are much more interesting and totally unanticipated, with formula $U_2X@C_{2n}$, where $X = C, O, S$ or N and $2n = 72, 78$ or 80 , which reveal interesting metal-cage interactions and totally unprecedented clusters trapped inside. Some of the carbide compounds have been crystallized and the encapsulated U_2C cluster (in $U=C=U@C_{80}$) exhibits unprecedented bonding with totally unanticipated properties.

Finally, we have found that bis-porphyrin capsules exhibit exquisitely selective supramolecular binding for several of these uranium-based endohedral fullerene compounds.

The synthesis, purification and characterization of these interesting endohedral fullerenes will be presented and discussed, along with very recent results about uranium-based endohedrals.

