

Inorganic super-fullerenes: remarkable versatility for nano-confined functionalization

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Abstract

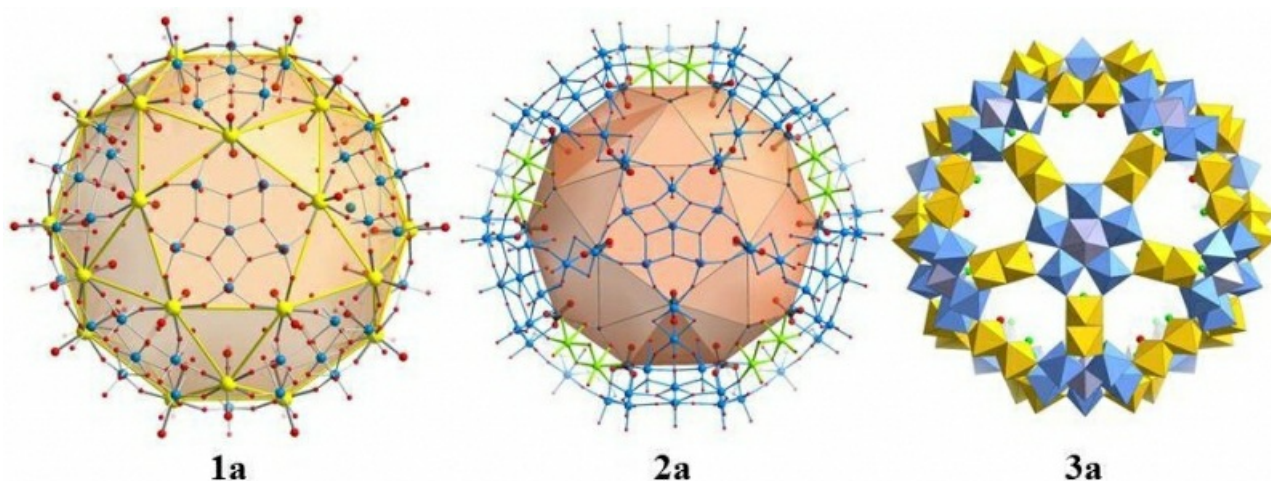
The unique spherical nanocapsules/Keplerates of the type $\{(Mo)Mo_5\}_{12M'30}$ ($M' = \{Mo_2\}, VO(2+), Cr(3+), Fe(3+)$) (more generally: (pentagon)₁₂(spacer/ligand)₃₀) allow – due to their exceptional structural features and easy variations/derivatizations – versatile chemistry and applications as well as the option to study new phenomena of interdisciplinary interest.[1a] In this poster we specially refer on the interesting neutral/charged species of $\{(Mo)Mo_5O_{21}(L)_6\}_{12}\{Fe(H_2O)L\}_{30}$ (L = H₂O/CH₃COO-/Mo₂O₈/9) compound 1a/type[1b] not only because of their tremendous unusual magnetic properties which exhibit spherical networks based on corner-shared M'3 triangles causing geometrical frustration analogous to that of the planar Kagomé lattices but also for their behavior as unique weak polyprotic acids owing to the external water ligands attached to the M' metal centers. In the second part we refer to the fact that the capsule $\{(Mo)Mo_5O_{21}(H_2O)_6\}_{12}\{Mo_2O_4(CO_3)\}_{30}$ (72-) compound 2a[2] containing 30 carbonate ligands is a potential starting reagent for the synthesis of novel capsules with weakly coordination ligands such as fluoride ions $\{(Mo)Mo_5O_{21}(H_2O)5F\}_{12}\{Mo_2O_4(F)(H_2O)\}_{30}$ (69-) compound 3a.[3]

Figure. Ball-and-stick representation for the structures of the nano-anions of compound 1a, 2a and 3a.

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[2] S. Garai, E. T. K. Haupt, H. Bögge, A. Merca, A.Müller, Angew. Chem. Int. Ed., 2012, 51, 10528.

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Keywords: [Nanoscaled Encapsulation](#), [CO2 Uptake](#), [F- scavenger](#).