

## Nano-pseudomorphic chemistry:

### Epochal structural transformation of nanocrystals by element replacement

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Chemical conversion of inorganic nanocrystals (NCs) via element replacement reactions, such as ion exchange reactions and galvanic replacement reactions, can overcome the difficulties associated with controlling the size, shape, chemical composition and crystal structure in conventional syntheses. The retained shape of the parent-NCs in element replacement reactions provides an opportunity to obtain non-equilibrium unique structures and even new structures of inorganic NCs, these final structures being known as “pseudomorphs” [1-4]. Here I present the nano-pseudomorphic chemistry to give unique semiconductor [5] and metallic NCs [6].

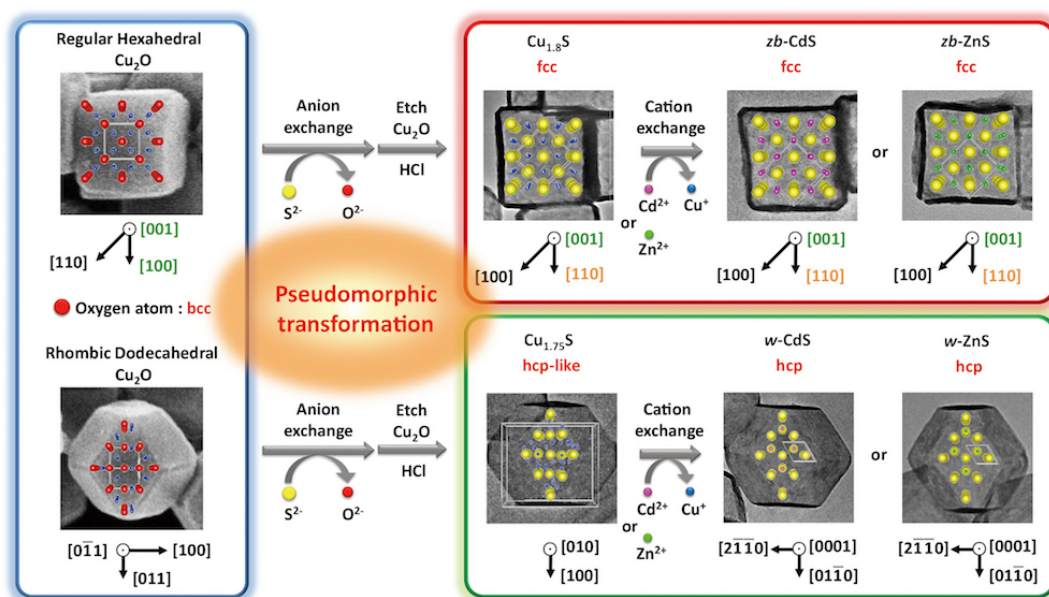


Figure 1: Pseudomorphic transformation of regular hexahedral and rhombic dodecahedral  $\text{Cu}_2\text{O}$  nanocrystals into various semiconductor nanocages with surface anion framework-dependent crystal phases.

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- [2] *Chem. Eur. J.* **2012**, 18, 9230. (Frontispiece)
- [3] *J. Phys. Chem. Lett.* **2013**, 4, 2867. (Perspective)
- [4] *Chem. Sci.* **2014**, 5, 3881.
- [5] *Science* **2016**, 351, 1306.
- [6] manuscript in preparation.