

## Reshaping of shaped $\text{Cu}_2\text{O}$ nanocrystals by metal ion-assistance and their catalytic performance for CO oxidation

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Copper oxide materials are well-known materials with their low band-gap energy and high catalytic activity, as well as their nontoxic nature and affordable price. They have been employed for CO oxidation, gas detoxification, water splitting photocatalytic reaction, and as electrode materials for lithium ion batteries, etc. In this study, we demonstrate a novel strategy to synthesize its unique hollow structures upon the addition of various metal ions with two different shapes of  $\text{Cu}_2\text{O}$  nanocrystals (cubes and octahedra). The cubes and octahedra turned into hollow shapes with numerous needle-like branches on their surface, and the  $\text{Cu}_2\text{O}$  was oxidized into  $\text{CuO}$  and they developed into these  $\text{Cu}_2\text{O}/\text{CuO}$  composites. The metal existed on their surface. The composites with unique shapes were analyzed with ICP, XPS, TEM, FIB, EDS, etc and showed interesting catalytic property for CO oxidation.