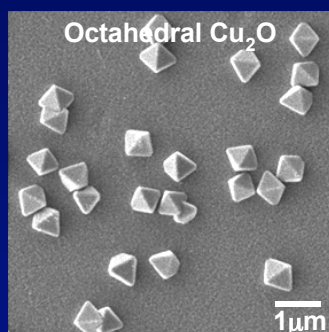
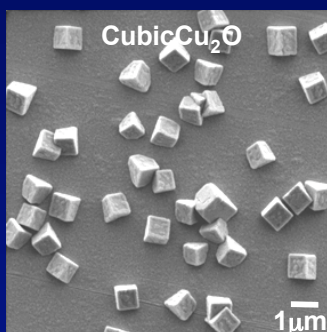


Synthesis of Inorganic Electrodes with Controlled Interfacial Structures by Crystal Engineering in Electrodeposition

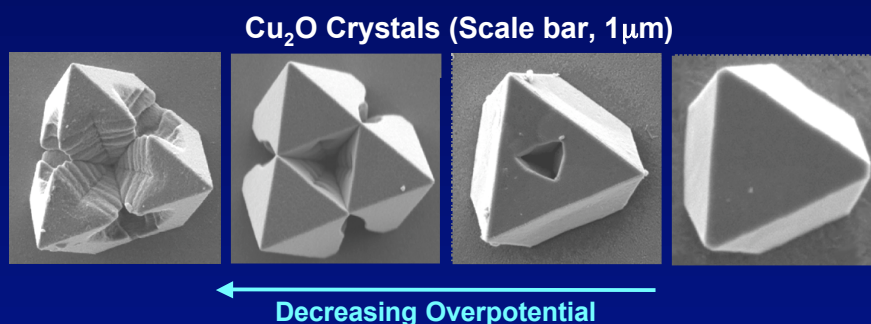
Kyoung-Shin Choi, Department of Chemistry, Purdue University

The overall goal of our research is to produce various inorganic polycrystalline electrodes with optimum interfacial structures that can enhance desired functional properties. We achieve this goal by precisely tuning the individual shapes of crystals in the polycrystalline electrodes and studying their morphological effects on physical and chemical properties. Specific growth processes we investigate include:

Habit formation and modification - Regulation of crystal shapes by altering growth rates and directions

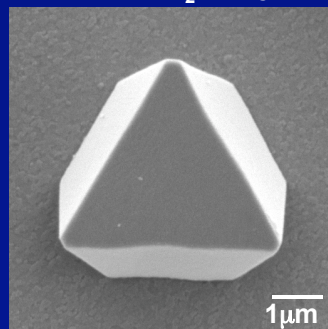


Overpotential-limited branching growth - Systematic changes in the degree of branching by tuning overpotentials



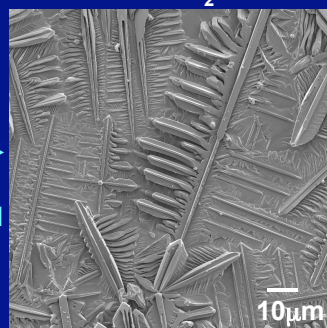
Diffusion-limited branching growth - Creation of high surface area electrodes with enhanced reactivities

Faceted Cu_2O Crystal



Increasing overpotential

Dendritic Cu_2O films



Wire and Fibrous Growth - Enhancement of charge transport properties due to their 1D architectures

SnO_2 Films with Wire Morphology

