The effect of tailoring the synthetic strategy on the final copper oxide structure

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Abstract

Copper structures in nano- and micro- scale have been a subject of great scientific and industrial interest ranging from photovoltaics, gas sensors to catalysts and photonic crystals. Furthermore, they have been of great interest as fillers, coatings, capsule agents, etc., because of their unique anti-biofouling properties. A very interesting topic is the effect of the different materials used in the size, shape, morphology and crystal structure of the final products [1, 2].

Herein, we report a size and morphology-controlled synthesis of cupric (CuO) or cuprous oxide (Cu_2O) structures with spherical, octahedral and wire-like morphology by the sol-gel process with a simple solution phase route. The aim of the present study is the production of containers used in protective coatings with anticorrosion and antifouling properties and the associated synthesis mechanisms related to the final structure. The size and structure of these unique materials were determined by physical and chemical characterization techniques such as scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), X-ray powder diffractometer (XRD), Infrared Spectroscopy (FT-IR) and UV spectroscopy (UV-VIS).

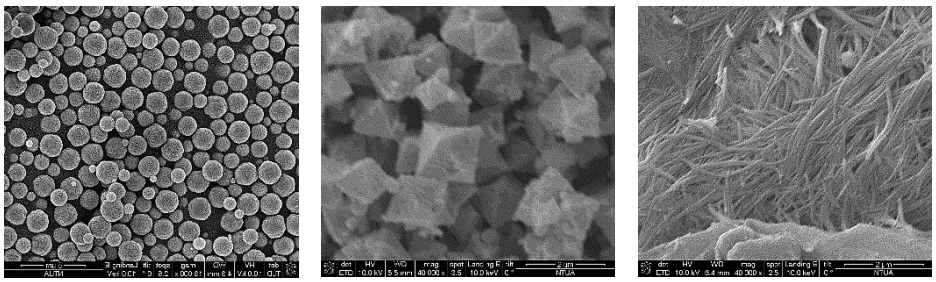

Figure 1. SEM images of copper oxide with spherical, octahedral and wire-like strucrure.

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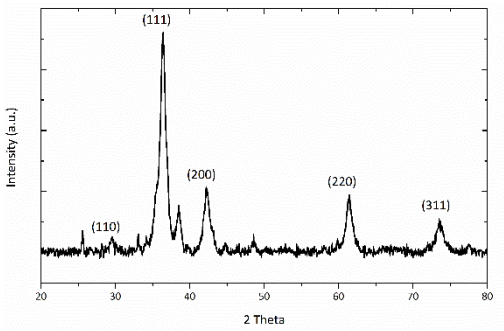

Figure 2. Characteristic XRD spectrum of the as-prepared cuprous oxide materials.

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References

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