



A Novel ZnO Catalyst

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Summary: A method to produce unique ZnO structures that are rich in defect sites

Description: ZnO is a widely used in catalysts, electrical devices, optoelectronics, and pharmaceuticals. The functional properties of ZnO dependent upon their composition, shape and size, and defect structure and efforts have focused on preparing ZnO catalysts with controlled shapes and morphologies. This invention is of a synthetic method to produce flower-like and hole-rich single crystal ZnO. The presence of holes indicate defects in the crystalline structure and may contribute to catalytic activity. The size and shape of the ZnO structures can be controlled by varying the synthetic conditions. The unique surface chemistry of a ZnO crystalline nanostructure is used to catalyze a variety of chemical reactions. One such reaction is the hydrogenation of carbon dioxide to methanol. Alcohols interacts both molecularly and dissociatively with the single-crystalline ZnO surfaces at room temperature and can be partially oxidized by increasing the temperature.

Main Advantages of this Invention:

- Inexpensive to produce
- Simple to produce in large quantities
- Mild reaction conditions during hydrogenation or oxidation reactions

Potential Areas of Application:

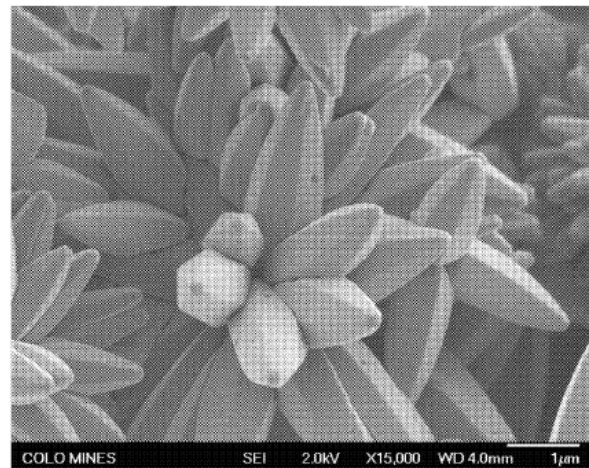
- Conversion of CO₂ to Methanol
- Other hydrogenation reactions
- Oxidization reactions

ID number: 9003

Intellectual Property Status: US provisional patent (application #12/685,465)

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Opportunity: We are seeking an exclusive or non-exclusive licensee for marketing, manufacturing, and sale of this technology.



Scanning electron microscope image of ZnO structure prior to calcination

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