

The International Debate on Metal and Non-Metal Doped CuO for Glucose Sensing

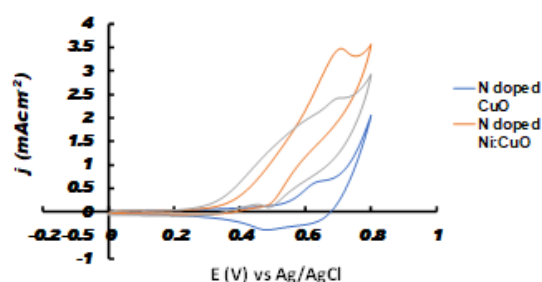
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Various alloys and noble metals perform well in the development of non-enzymatic electrochemical sensors, but they are expensive, poisonous and undergo energy reduction when being used. Metal oxides are suitable alternatives for glucose detectors as they are available, affordable, stable, easy-to-use and provide a large surface area. Some metal oxides that has been employed in designing non-enzymatic electrochemical sensors include; Co_3O_4 , CuO , ZnO , SnO and NiOH_2 etc. Copper oxide (CuO) is particularly interesting among others as it is a readily available semiconducting compound affiliated with the monoclinic crystal system. CuO is an inexpensive p-type semiconductor characterized by an array of functional physical and chemical properties, including high temperature superconducting properties and electron correlation effects. Copper oxide has been widely studied for various applications owing to its superior electrocatalytic capability, glucose oxidation, exceptional resilience and its eco-friendliness. CuO has been utilised in catalysts, electronics, solar cells, storage devices, and thermal transfer fluids.

Recently it has been studied that doping elements into the metal oxide host structure improves electronic properties. Moreover, oxygen vacancy plays an important role in increasing electronic properties of the metal oxide. In this study metal (Ni) and

non-metal atom (N) was doped into the CuO lattice structure. The as developed material showed enhanced electrochemical glucose oxidation properties (Figure 1).



Biography :

Mahabubur Chowdhury holds a doctoral degree in Chemical Engineering and is currently a senior lecturer in the department of chemical Engineering at Cape Peninsula University of Technology. His research is on advanced functional materials for bio sensing and water treatment. His interest is on the relationship of electronic structure and ionic transport properties in semiconductor electrodes. He has published many journal articles, conference proceedings, book chapter and patent.