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**Influence of synthesis parameters on the morphology, purity and phases type of nano-CuO particle**

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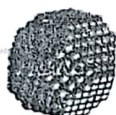
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In this study, copper oxide nanoparticles were produced using an environmentally friendly method involving the mixing of copper salt precursors and aqueous leaf extract of *Khaya senegalensis*. The influence of pre and post synthesis parameters such as solution pH (5, 9, 11, 13), copper salt types



## BOOK OF ABSTRACTS

(chloride, nitrate and sulphate), calcination temperature (300-550 °C) and holding time (1-3 h) on the morphology, sizes and phase structure of CuO nanoparticles were examined. The synthesized materials were characterized by energy dispersive spectroscopy (EDS), high resolution scanning electron microscope (HRSEM), Brunauer Emmett Teller (BET) N<sub>2</sub> adsorption-desorption, X-ray photoelectron spectroscopy (XPS), and X-ray diffraction (XRD). The HRSEM/XRD analysis of the calcined CuO nanoparticles showed the formation of spherical and crystalline stable tenorite phase at optimum calcination temperature (550 °C), and optimum holding time (3 h) for all the salt precursors except for cupric acetate at pH of 7 and 13 with no defined shape. The XRD results also revealed that the average crystallite size of CuO nanoparticles increased with increasing temperature and holding time. The optimum condition to prepare CuO nanoparticles was using copper sulphate salt and solution pH 11. This study demonstrated that the shape, size and phase of CuO nanoparticles were dependent on the nature of the copper precursor, solution pH, calcination temperature and holding time.

**Keywords:** Synthesis parameters, CuO nanoparticles, green method, phase types