

## *Abstract:*

Due to several drawbacks of physiochemical processes for the synthesis of nanoparticles, the green synthesis technique is adopted which has many advantages over chemical and physical methods. With the help of the green synthesis technique, CuO nanoparticles are prepared using the extract of cucumber. These synthesized particles are used to investigate the antimicrobial and photocatalytic degradation activities. The results reveal that synthesized CuO NPs show good performance against bacteria (*E. Coli* & *B. Subtilis*) and helps in the removal of dyes from industrial waste. CuO NPs are characterized by different techniques such as UV-Vis, FTIR, and SEM. The results of UV-Vis show an SPR peak at 290 nm and the FTIR spectrum also helps in the determination of the functional groups present in the extract and in the synthesized nanomaterial. The Morphology and composition of the product are investigated using SEM and EDX analysis. The size of the CuO NPs varies between 40-50 nm and they are spherical in shape. EDX analysis confirms that the material is composed of 41% Cu and 32% oxygen. The photocatalytic activity of the CuO NPs is studied against MB dye and the results show that CuO NPs degrade the MB dye up to 50.87%. These results of antimicrobial indicate that CuO NPs are more efficient against gram-positive bacteria (*B. Subtilis*) as compared to gram-negative bacteria (*E. Coli*).