

عنوان مقاله:

Silica-Supported Copper Oxide Nanoleaf with Antimicrobial Activity Against Escherichia Coli

محل انتشار:

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خلاصه مقاله:

In this research, a simple and fast method was employed to synthesize CuO nanoleaves/silica gel nanocomposites (CuO/SGn), which is a cost effective antimicrobial material. CuSO₄.5H₂O is the only raw material used in CuO/SGn production through the molten salt method. The structure and morphology of the nanocomposites were characterized by DRS, XRD, and SEM. The copper size in CuO/SG was found to be dependent on the immersion time in molten salt. SEM images revealed smaller-sized particle leaves, from a sample obtained after longer immersion time. The antimicrobial activity of CuO/SGn was investigated against Escherichia coli. The produced CuO/SGn showed inhibitory effect against E. coli. However, the growth-inhibitory effect depends on the copper content and size. Lower loading of CuO nanoparticles in 10 min immersion time resulted in less antibacterial activity (73.33%) and sample obtained from longer immersion time demonstrated higher antibacterial activity (up to 99.96%). The maximum amount of released Cu ions from nanocomposites produced in 90 min was 12.2 ppm after 6 h. Furthermore, the minimum release of Cu ions was observed by 3 h for 40 min nanocomposite.

کلمات کلیدی:

Antimicrobial Activity, Copper Oxide, Nanoleaf, Silica

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