Patent Search

Invention Title	BIOGENIC SYNTHESIS OF COFE2O4@AG NANOCOMPOSITES FROM CARISSA CARANDAS PLANT BARK CORTEX FOR THEIR POTENT PHOT ANTIBACTERIAL AND CYTOTOXIC ACTIVITIES
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Abstract:

Carissa carandas, a traditional medicinal herb with a high concentration of antioxidant phytochemicals, has been used for thousands of years in the Ayurveda, Unani, homoeopathic schools of medicine. By employing Carissa carandas bark extract as a reducing and capping agent in green biosynthesis, we extend this conventional a produce CoFe2O4 and CoFe2O4@Ag nanocomposite. A variety of techniques have been used to analyse the synthesised nanocomposite, including UV-Vis, FTIR, XRD, and BET. The CoFe2O4 and CoFe2O4@Ag nanocomposite demonstrated promising antibacterial action against human bacterial pathogens like B. subtilis and S. aureu positive and P. aeruginosa and E. coli as gram negative with inhibition zones of 24.3 ± 0.57, 17.4 ± 0.75 and 20.5 ± 0.5, 19.8 ± 1.6 mm respectively, and the obtained re superior to the catalyst without silver. On the human breast cancer cell MCF-7, the in vitro cytotoxicity effects of biosynthesized CoFe2O4 and CoFe2O4@Ag were exa MCF-7 cells' 50% inhibitory concentration (IC50) was 60 µg/mL. Additionally, biosynthesized CoFe2O4 and CoFe2O4@Ag nanocomposite was used to demonstrate the photocatalytic eradication of Rhodamine Blue (RhB). Due to the addition of Ag, which increases surface area, conductivity, and increased charge carrier separation, th CoFe2O4@Ag nanocomposite exhibits a high percentage of photocatalytic degradation of ? 98% within 35 min under UV light irradiation. Consequently, it is anticipate CoFe2O4@Ag nanocomposite will be a promising photocatalyst and possibly a noble material for environmental remediation applications.

Complete Specification

Description:Field of invention:

[0001] By employing Carissa carandas bark extract as a reducing and capping agent in green biosynthesis, we extend this conventional application to produce C and CoFe2O4@Ag nanocomposite. Various techniques have been used to analyse the synthesised nanocomposite, including UV-Vis, FTIR, XRD, FESEM, E.D.X., and B CoFe2O4 and CoFe2O4@Ag nanocomposite demonstrated promising antibacterial action against human bacterial pathogens like B. subtilis and S. aureus as gram p and P. aeruginosa and E. coli as gram-negative with inhibition zones of 24.3 ± 0.57, 17.4 ± 0.75 and 20.5 ± 0.5, 19.8 ± 1.6 mm respectively, and the obtained results w superior to the catalyst without silver. The human breast cancer cell MCF-7, the in vitro cytotoxicity effects of biosynthesized CoFe2O4 and CoFe2O4@Ag were exam The MCF-7 cells' 50% inhibitory concentration (IC50) was 60 µg/mL. Additionally, biosynthesized CoFe2O4 and CoFe2O4@Ag nanocomposite demonstrated the photocatalytic eradication of Rhodamine Blue (RhB). Due to the addition of Ag, which increases surface area, conductivity, and charge carrier separation, the CoFe2O nanocomposite exhibits a high percentage of photocatalytic degradation of ? 98% within 35 min under U.V. light irradiation. Consequently, it is anticipated that the CoFe2O4@Ag nanocomposite will be a promising photocatalyst and possibly a noble material for environmental remediation applications.

Background of invention:

[002] Pollution is one of the biggest issues facing developing nations [1, 2]. This issue is exacerbated by pollutants leading to massive water contamination that depletes quantity and quality, including industrial effluent with dyestuff and heavy metal traces[3]. Without being treated, the wastewater of various companies dis 5 tonnes of organic compounds annually, damaging freshwater resources [4]. Many dangerous human diseases are thought to have been brought on by this contaminated/unhealthy water [5]. In addition to the paper, plastic, printing, and leather sectors, the textile industry regularly uses rhodamine B (RhB) to colour wo

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