

Controlled Release of Benzanthrone derivative Using Polymeric Coated ZIF-8 Metal-Organic Framework

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Controlled drug delivery systems have developed as a feasible alternative to traditional methods for increasing bioavailability, extending drug release, and keeping medication plasma levels within the therapeutic window while minimizing adverse effects. Metal-organic frameworks (MOFs) as a drug delivery system have received interest because of their unique properties, such as coordinately unsaturated centers, large surface area, and ease of synthesis. In this context, ZIF-8@alginate was synthesized as a carrier. Benzanthrone (6A) was synthesized, as an oral antihyperglycemic agent for the treatment of type II diabetes and trapped inside the alginate-coated ZIF-8 pores. The goal of this study is to examine the use of polymeric coated ZIF-8 as drug carriers to improve the control release rate of 6A. The findings showed that the problem of rapid ZIF-8 degradation in acidic pH is resolved and its stability is improved by utilizing sodium alginate, a biocompatible polymer. In addition, the regular porosity of the MOF, as well as the presence of metal ions, could help to increase the effectiveness and controlled release of the 6A compound improving the drug's bioavailability. The Benzanthrone (6A) and 6A-ZIF-8@Alginate formulation are characterized by powder X-ray diffraction (XRD), thermogravimetric analysis (TGA), Fourier transform infrared spectroscopy (FT-IR), NMR, scanning electron microscopy (SEM) and Brunauer-Emmett-Teller surface area analysis (BET).

Biography

Abdullah Khalaf, a dedicated and passionate researcher, has undertaken scientific projects in the fields of diabetes, iodine absorption, and germ classification. In his diabetes-related project, Abdullah explored the impact of dietary interventions on blood glucose regulation, providing valuable insights into managing diabetes. His research on iodine absorption investigated the efficiency of different materials in capturing atmospheric iodine, contributing to environmental and health applications. Abdullah's work on germ classification in a healthcare setting enhanced understanding and promoted effective infection control practices. With his commitment to advancing knowledge and addressing health-related issues, Abdullah Khalaf's dedication and scientific acumen are evident in his research contributions.

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