DRUG DELIVERY SYSTEM: LARGE PORE SBA-15 AS HOST FOR KETOROLAC TROMETHAMINE

Juliana M. Juárez, Jorgelina Cussa, Oscar A. Anunziata, Marcos B. Gómez Costa

Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC). Facultad Regional Córdoba, Universidad Tecnológica Nacional, Maestro López y Cruz Roja Argentina, 5016, Córdoba, Argentina.

*E-mail: jjuarez@frc.utn.edu.ar

Abstract:

Drug-controlled release systems can keep the level of drugs in precise doses in the body above the optimal level and with low toxicity. We propose the LP-SBA-15 nanomaterial as a promising new host for drug delivery systems because of its high biocompatibility, in vivo biodegradability, and low toxicity. Ketorolac-LP-SBA-15 was prepared and characterized by XRD, FTIR, UV-Vis DRS, TEM, and texture analysis, determining the adsorption capacity and its release, achieving the required therapeutic efficacy. The host shows ordered mesoporous nanochannels with a diameter of 11-12 nm, maintaining the structure with the incorporation of Keto. The mechanism of drug release the LP-SBA-15 host was evaluated. Different mathematical models were used to adjust the experimental data, being the Ritger-Peppas model followed by the Weibull model the best ones. In this work, we show a promising drug storage material for effective encapsulation and controlled release of KETO, achieving the required therapeutic efficacy. Studies indicate that KETO was adsorbed on the channel surface of LP-SBA-15 without affecting the structure or chemical composition of KETO.

Controlled drug delivery systems can achieve precise delivery at the time and place of destination, keeping the concentration of the drug at points in the body within the optimal range and below the toxicity threshold. The study also demonstrates the storage capacity and release properties of LPSBA-15 containing KETO. The release of KETO contained in LP-SBA-15 can offer a significant improvement in the controlled release of the drug and the analgesic and anti-inflammatory effects, positively influenced, by the links formed between the host and drug molecules and by diffusion through the host porosity. The promising results we obtained for the release of the drug thoroughly using the new material, reaching a rapid initial release rate, and maintaining a constant rate afterward, allow us to maintain the concentration of the drug in the therapeutic efficacy range, applying it largely to the treatment of diseases that require a rapid response.

Biography of presenting author (should not exceed 100 words)

Juliana María Juárez had received the B.E. and Ph.D. degrees in Chemical Engineering from Universidad Tecnológica Nacional, Facultad Regional Córdoba, Argentina, in 2005 and 2015, respectively. In the research career, he became doctoral fellow, postdoctoral fellow, assistant researcher and now an adjunct researcher of the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina. Dr. Gómez Costa is a member of Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC), Facultad Regional Córdoba, Universidad Tecnológica Nacional – FRC. His current research interests include hydrogen storage on nanoporous materials, conducting polymers and drug controlled release systems.

Details of presenting author to be mentioned in the certificate:

Name: Juliana M. Juárez
Affiliation: Centro de Investigación en Nanociencia y Nanotecnología (NANOTEC). Facultad Regional Córdoba, Universidad Tecnológica Nacional, Maestro López y Cruz Roja Argentina, 5016, Córdoba, Argentina.
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