

RESEARCH ARTICLE

## Nanostructured Ketorolac-Tromethamine/MCF: Synthesis, Characterization and Application in Drug Release System

Juliana M. Juárez<sup>a</sup>, Jorgelina Cussa<sup>\*a</sup>, Marcos B. Gómez Costa<sup>a</sup>, Oscar A. Anunziata<sup>a</sup>

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

**Abstract: Background:** Controlled drug delivery systems can maintain the concentration of drugs in the exact sites of the body within the optimum range and below the toxicity threshold, improving therapeutic efficacy and reducing toxicity.

Mesostructured cellular foam (MCF) material is a new promising host for drug delivery systems due to high biocompatibility, *in vivo* biodegradability and low toxicity.

**Methods:** Ketorolac-Tromethamine/MCF composite was synthesized. The material synthesis and loading of ketorolac-tromethamine into MCF pores were successful as shown by XRD, FTIR, TGA, TEM and textural analyses.

**Results:** We obtained promising results for controlled drug release using the novel MCF material. The application of these materials in KETO release is innovative, achieving an initial high release rate and then maintaining a constant rate at high times. This allows keeping drug concentration within the range of therapeutic efficacy, being highly applicable for the treatment of diseases that need a rapid response. The release of KETO/MCF was compared with other containers of KETO (KETO/SBA-15) and commercial tablets.

**Conclusion:** The best model to fit experimental data was Ritger-Peppas equation. Other models used in this work could not properly explain the controlled drug release of this material. The predominant release of KETO from MCF was non-Fickian diffusion.

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### ARTICLE HISTORY

Received: November 22, 2017  
Revised: February 09, 2018  
Accepted: February 15, 2018

DOI:

10.2174/1573413714  
666180222134742

**Keywords:** MCF, ketorolac tromethamine, nanostructured composite, drug delivery system, therapeutic efficacy, nanomedicine.