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SILOXANE-PMMA NANOCOMPOSITES AS DRUG DELIVERY SYSTEM

B. Ferreira⁽¹⁾, K. Dahmouche⁽²⁾, C.M. Paranhos⁽³⁾, and A.S. Gomes⁽⁴⁾

- (1) Universidade Estadual da Zona Oeste (UEZO), Rio de Janeiro, RJ, Brazil. biaf09@gmail.com
- (2) Universidade Estadual da Zona Oeste (UEZO), Rio de Janeiro, RJ, Brazil. karim@ima.ufrj.br
- (3) Universidade Federal de São Carlos (UFSCAR), São Paulo, SP, Brazil. caio.paranhos@gmail.com
- (4) Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, RJ, Brazil. asgomes@ima.ufrj.com

The preparation, characterization, and in vitro release of Rifampicine from polymethylmethacrylate (PMMA)/silica composites prepared via a sol-gel route are reported. The in vitro drug release test revealed that the release rate of Rifampicine increased with the silica content in the composites; on the contrary, the increase of PMMA amount decreased the drug release rate. The drug release rate/composite structure relationship was studied using Fourier transform infrared spectroscopy (FTIR), X-Ray diffraction (XRD), scanning electron microscopy (SEM) and swelling ratio (SR) measurement. The results indicated that the nature of the interface between polymer matrix and inorganic fillers and the drug concentration have significant influence on the drug release behavior of the composite materials. This outstanding feature conjugated with the biomedically-safe formulation of the silica-PMMA composites widens their scope of application to include the domain of soft and implantable drug delivery devices.