

Study of the Influence of Different Factors Affecting Albendazole Loading on SBA-15 Carrier by Box-Behnken Design [†]

M. Esperanza Adrover ^{2,3}, Marisa Pedernera ^{2,3}, Magali Bonne ^{4,5}, Bénédicte Lebeau ^{4,5}, Verónica Bucalá ^{2,3}, Loreana Gallo ^{1,3,*}

¹ Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur (UNS), 8000 Bahía Blanca, Argentina

² Departamento de Ingeniería Química, Universidad Nacional del Sur (UNS), 8000 Bahía Blanca, Argentina

³ Planta Piloto de Ingeniería Química, PLAPIQUI (UNS-CONICET), 8000 Bahía Blanca, Argentina

⁴ Université de Haute Alsace (UHA), CNRS, IS2M UMR 7361, 68100 Mulhouse, France

⁵ Université de Strasbourg, 67000 Strasbourg, France

* Correspondence: lgallo@plapiqui.edu.ar (L.G.);

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Abstract: Albendazole (ABZ) is an antiparasitic drug that belongs to the BSC II classification. Mesoporous materials loaded with poorly soluble drugs (BSC II) become an interesting strategy to increase their solubility/dissolution rate as the drug's crystalline state changes into an amorphous one. However, high drug loading into mesoporous materials still constitutes a challenge. The purpose of this work was to study the influence of different factors affecting ABZ loading on the mesoporous carrier SBA-15: temperature (25, 37.5, and 50°C), soaking time (24, 48, and 72 h) and SBA-15 mass (83.2; 167.6 and 252.0 mg). The effect of these factors was analyzed using the Box-Behnken design. The drug loading experiments were done by the immersion method, and the amount of loaded ABZ was quantified by elemental analysis. The loading conditions of 37.50°C, 24 h, and 83.2 mg SBA-15 allowed the maximum drug loading (35.84 %, w/w). As the SBA-15 mass and soaking time decreases, the percentage of ABZ loading increases. The SBA-15 mass had the highest significant influence on the drug loading. In conclusion, these results show the relevant effect of the loading conditions and, consequently, the requirement to optimize these parameters.

Keywords: albendazole; SBA-15; Box-Behnken design.

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Conflicts of Interest

The authors declare no conflict of interest.