

Mesoporous Excipients for Improved Formulations

Shen Shoucang, Leonard Chia, Ng Wai Kiong, Reginald B.H. Tan

Nanosized mesoporous drug carriers offer enormous potential to enhance the bioavailability of active ingredients (AIs) by improving both aqueous solubility and stability. Being chemically modified at the surfaces, the mesoporous materials act as an excipient to entrap AIs in the amorphous form inside the nanosized pores. This novel formulation exhibits significantly improved dissolution properties over pure AIs and desired drug release profiles can be finely tailored by modifying the surface chemistry of the functionalized excipients. As shown in Fig. 1 below, the dissolution rate of ibuprofen formulated with SBA-15 silica has been significantly enhanced as compared with commercial-grade ibuprofen. Besides the homogeneous drug dispersion within the pores of SBA-15, the improved dissolution properties are attributed to the amorphous form of ibuprofen. This amorphous form has been stabilized within the mesoporous materials against re-crystallization under accelerated stability conditions of 40°C and 75%RH for over 1 year.

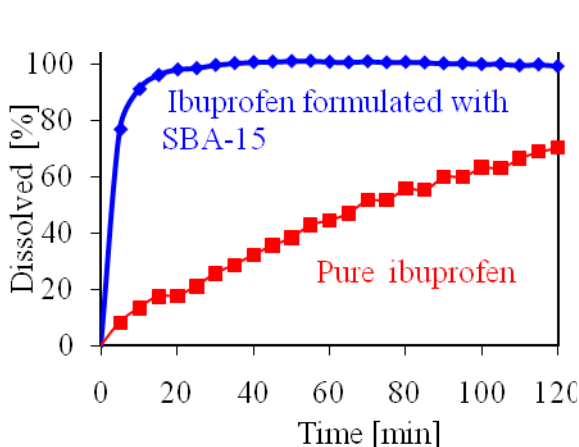


Fig. 1 Dissolution profiles of ibuprofen

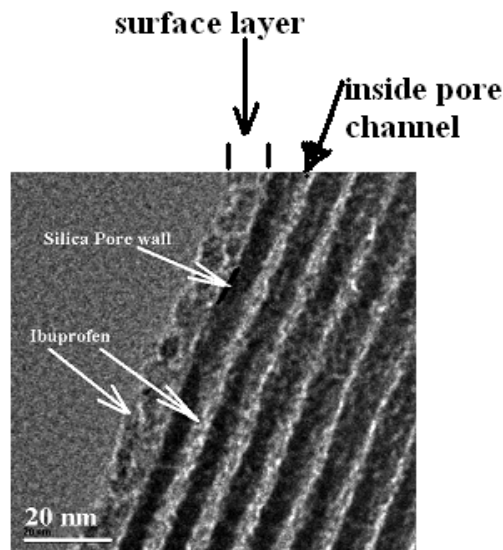


Fig. 2 TEM of ibuprofen-loaded SBA-15

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