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Thermo-chemical energy storage and heat transfer in a flow of hydrated magnesium sulfate GANESH BALASUBRAMANIAN, Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, SOHAIL MURAD, Department of Chemical Engineering, University of Illinois at Chicago, ISHWAR K. PURI, Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University — Salt hydrates undergo desorption on being heated above certain charging temperatures, releasing water and forming anhydrous salts which have a higher energy content. Since these salts are hygroscopic, energy is easily retrieved back by passing water vapor over the anhydrous form. Such a technique of energy conversion, storage and retrieval enables these salts to be impregnated into porous media for thermo-chemical energy application. However, to investigate the thermal transport at the interface of the porous material and the salt, atomistic simulations are necessary. We employ molecular dynamics to simulate the heat transfer mechanism in a flow of hydrated magnesium sulfate impregnated into mesoporous silica and understand the role of interfacial thermal resistance on the charging temperature and total heat storage capacity of such salts.

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