

Abstract Submitted  
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**Seawater desalination using ion removal kinetics of MOF-incorporated alginate composite**<sup>1</sup> HYEONG WOO LIM, SUNG HO PARK, SANG JOON LEE, Pohang University of Science and Technology — Water scarcity is one of the global issues resulted from water pollution and population growth. To resolve this problem, various seawater desalination technologies, such as reverse osmosis, multi-stage flash, and solar evaporation, have been developed, because abundant seawater is easily accessible. Adsorptive desalination method can remove pollutants or ionic matters without consuming energies. In this study, an adsorptive metal-organic framework (MOF)-embedded alginate hydrogel intertwined with poly(vinyl alcohol) (PVA) was proposed to get high ion removal efficiency and long durability. The adsorption performance of the fabricated hydrogel, including adsorption kinetics, ion removal rate, and adsorption/desorption cycle test, was examined by using NaCl solution and seawater. As a result, the adsorption equilibrium state was reached within 4 hours and the maximum ion removal rate was 33 %. Furthermore, when the proposed hydrogel was reused for cycle tests, the total ion removal efficiency was slightly reduced and kept higher than half after 10 repeated cycles. These results imply that the proposed hydrogel would be utilized in an effective desalination with a high concentration.

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