Mechanical study of CO_2 sorption on salt-promoted MgO-CeO_2 under practical gas conditions in the presence of H_2O

방진아[1], 진성민[1,2], 이창하[1,†]
[1]연세대학교; [2]École polytechnique fédérale de Lausanne
(leech@yonsei.ac.kr†)

The enhancement mechanism of H_2O dissociation-promoted CO_2 sorption on the MgCeOx surface was studied through in situ DRIFTS analysis. Among solid CO_2 sorbents, MgO attracts attention due to its applicability at high pressure and intermediate temperature. Notably, it has been found that H_2O promotes sorption performance but still lacks insight into the dynamic sorption process under the corresponding conditions. Herein, the main contributor and mechanism to the CO_2 sorption in each condition were analyzed through the in situ DRIFTS results measured with the injection of a mixture gas of CO_2, H_2O, and Ar. The adsorbed OH groups grew significantly with monodentate carbonate at the early sorption stage, leading to H_2O dissociation-promoted sorption process. This study reveals the contribution of H_2O to the performance improvement of the sorbent when applying the MgO-based CO_2 sorbent to the actual process.