

수소 생산을 위한 산소전달입자의 성능 향상

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We report the activation principle, the different forms of activated oxygen carriers, and the optimal activation method for iron-based oxygen carriers. Accurate knowledge of the activation process for an oxygen carrier is a key issue in the development of particles and optimization of a chemical looping system. In this study, we found that two key factors, the interaction between iron oxide and the support as well as the localized hematite-lower oxides stress, are fundamental reasons for the activation of iron-based oxygen carriers. The dispersion of the iron oxide in the activated particles was determined by the iron oxide-support interaction. The larger the localized stress applied at the interface between the hematite and lower oxides, the more cracks/pores that were created, facilitating gas diffusion. We expect these findings will be useful in developing high-performance oxygen carriers and activating them efficiently.