

수소생산용 산소전달입자의 지지체에 대한 성능 및 형상 변화

조원철, 강경수<sup>†</sup>, 정성욱, 박주식, 배기광  
한국에너지기술연구원

Chemical looping is a process by which feedstocks are converted into electricity or high-value products with concomitant CO<sub>2</sub> capture. The efficiency and design of the process depends on the performance of its components, including the oxygen carriers, which participate in various redox transformations. Here, we examine the activation of iron oxides supported on zirconia for hydrogen production and discuss their reactivity in terms of morphological changes. The activation of fresh particles was mainly attributed to the enhanced gases/ionic oxygen diffusivity over the support material. Herein, we found that two key factors, the iron oxide-support interaction and the localized stress at the lower oxides-hematite interface, were the fundamental reasons for the activation of the particles. Different forms of the activated particles could be observed by altering the reduction and oxidation conditions, and the differences could be explained by the interaction of the aforementioned key factors. We also examine the optimal activation method.