

## Analysis of changes in properties and activity of Mn-based oxygen transfer particles according to the addition of Mg, Ti, and Al oxides

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Fossil fuels are an important energy source in our lives. However, in the case of fossil fuels, most of them go through a process of combustion in order to convert them into required energy, thereby causing various environmental pollution problems. Among various eco-friendly combustion methods, chemical medium circulation combustion is a technology that is in the spotlight because it does not require purification to make pure oxygen by repeating the oxidation-reduction process of metal oxides, and thus enables easier pure oxygen combustion. In this case, the oxygen transport particles used are generally Ni, Fe, Mn, and the like. Ni, Fe, Mn, etc. are mainly used, but Ni has a disadvantage that the price is expensive, and Fe has a disadvantage that the speed is very slow when the fuel is burned. Therefore, in this study, on the basis of Mn having various oxidation numbers, Mg, Ti, Al, etc., which are used as a support, were mixed with Mn to confirm oxygen transfer capacity and chemical properties that change depending on the state of Mn. XRD, Raman, SEM, CO, CO<sub>2</sub>, and CH<sub>4</sub>-TPD were measured to analyze the physicochemical properties of the particles.