Comparison of the performance of chemical looping combustion process using Fe-Mn low-cost particles

손남규, 도정연, 박노국, 백점인[1], 류호정[2], 강미숙†
영남대학교; [1]한국전력연구원; [2]한국에너지기술연구원
(mskang@ynu.ac.kr†)

In Chemical Looping combustion, a redox reaction occurs in two separate reactors. As a result, CO_2 can be separated from the process without any additional CO_2 capture facility, and NO_x generated during the high temperature combustion process is blocked, and combustion efficiency is also high. In this study, Fe-Mn-based particles using Al2O3 as a support were used for the experiment. In the case of Fe, Fe^{2+} is not effective in the reaction with methane, but Fe^{3+} is very effective for oxygen transfer. Therefore, the precursor was composed of Me^{3+} containing oxides, and the spinel structure, which is structurally stable Me^{3+}, was formed and used. Particle efficiency was analyzed by TGA and XPS was used to analyze the oxidation state. XRD, SEM/EDS, and CV were used for analysis of other physicochemical properties. Thus, it was confirmed that sufficient oxygen transfer ability was obtained even if low cost particles were used.