

## Characterization of ferrites particles for thermochemical water splitting reaction

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Hydrogen production from water is one of the most important long-term goals for future energy resources. Hydrogen production from the direct thermochemical water splitting reaction is rather simple without any by-products. The metal oxides redox pair of  $\text{Fe}_3\text{O}_4/\text{FeO}$  system was selected in the simple two-step water splitting cycles since the system has suitable thermodynamic compatibility and its price. To overcome the temperature problem and improve fluidization quality in a fluidized bed,  $\text{MnO}$ ,  $\text{ZnO}$ , and  $\text{Nb}_2\text{O}_5$  were added to iron oxides by the solid phase method. The characteristics of those powders were analyzed by SEM, EDS, XRD, ICP and  $\text{N}_2$ -BET, respectively. In addition, attritions of each metal oxides particles were determined in the attrition tester (0.035 m-ID, 0.071 m-height) based on the ASTM D5757-95. The particulate collected in a flask at the top part of the tester was weighed to determine the attrition index. The obtained attrition data were analyzed in terms of the attrition index (AI) and the corrected attrition index (CAI). The particles were characterized by SEM image and its size distributions.