

## Study of the Reverse-Water-Gas-Shift Reaction (RWGSR) over supported-ZnO catalysts

정성훈, 정광덕<sup>1,\*</sup>, 박영권, 주오심<sup>1</sup>  
서울시립대학교; <sup>1</sup>한국과학기술연구원  
(jkdcacat@kist.re.kr\*)

Reverse-Water-Gas-Shift Reaction (RWGSR) was carried out over the ZnO, Al<sub>2</sub>O<sub>3</sub>, and ZnO/Al<sub>2</sub>O<sub>3</sub> catalysts at the temperature range from 400 to 700°C. The ZnO showed good specific reaction activity but this catalyst was deactivated. All the catalysts except the ZnO/Al<sub>2</sub>O<sub>3</sub> catalyst (850°C) showed low stability for the RWGSR and was deactivated at the reaction temperature of 600°C. The ZnO/Al<sub>2</sub>O<sub>3</sub> catalyst calcined at 850°C was stable during 210 hrs under the reaction conditions of 600°C and 150,000 GHSV, showing CO selectivity of 100% even at the pressure of 5 atm. The high stability of the ZnO/Al<sub>2</sub>O<sub>3</sub> catalyst (850°C) was attributed to the prevention of ZnO reduction by the formation of ZnAl<sub>2</sub>O<sub>4</sub> spinel structure. The spinel structure of ZnAl<sub>2</sub>O<sub>4</sub> phase in the ZnO/Al<sub>2</sub>O<sub>3</sub> catalyst calcined at 850°C was confirmed by XRD and electron diffraction.