

A New Method to Prepare Highly Dispersed Ni₂P/Al₂O₃ Catalyst for Deep HDS

이용걸*, 조계성, 김성호
단국대학교 화학공학과
(yolee@dankook.ac.kr*)

Nickel phosphide (Ni₂P) is a novel hydrotreating catalyst with high intrinsic activity, and has been generally synthesized by high temperature reduction techniques. Further increase of catalytic activity and practical application of Ni₂P require even better dispersion of active centers, which can be achieved by lowering final reduction temperature. In this study, nickel phosphide catalysts supported on Al₂O₃ were successfully prepared by the temperature-programmed-reduction (TPR) technique. In particular, this study adopted a new synthetic technique of “low temperature reduction (LT-TPR)” with use of less oxidic P precursor, hypophosphite, which enabled the Ni₂P to be successfully prepared at even lower reduction temperature of 400 oC. A wide range of techniques was used to characterize the catalysts: high resolution transmission electron microscopy (HRTEM), x-ray diffraction (XRD), and extended X-ray absorption fine structure (EXAFS) using synchrotron radiation(3C1 at PAL).