

## Copper oxide supported on titania as catalyst for wet air oxidation of phenol

김경훈, 김상경<sup>1</sup>, 임선기\*  
한국과학기술원; <sup>1</sup>한국에너지기술연구원  
(sklhm@kaist.ac.kr\*)

Wet air oxidation is the liquid phase oxidation of organics at elevated temperatures (125–320°C) and pressures (0.5–20MPa) using molecular oxygen as oxidant. Wet oxidation is suitable for the treatment of the wastewater which is too concentrated and/or toxic to be treated with biological approach because any organic compound could be ideally mineralized to the desired end product by wet oxidation. In this work,  $\text{CuO}_x/\text{TiO}_2$  catalysts with different copper loadings were prepared and characterized. Copper oxide catalysts supported on  $\text{TiO}_2$  with 1–25 wt% loading of each metal were prepared by incipient wetness impregnation method using  $\text{Cu}(\text{NO}_3)_2 \cdot 2.5\text{H}_2\text{O}$  as the precursors of copper. Their activity for wet air oxidation of phenol was investigated in a batch reactor (150°C, 5.05MPa): initial phenol concentration 1,000 ppm of the liquid phase, catalyst loading 3g/L. The phenol concentration and the TOC concentration of each sample were examined using a HPLC system and TOC analyzer. The prepared and used catalysts were characterized by  $\text{N}_2$  adsorption, XRD, TPR, and XANES experiments. The optimum copper loading of  $\text{CuO}_x/\text{TiO}_2$  catalyst was found for the wet air oxidation of phenol.