

**Recovery of tungsten and vanadium from a spent NH<sub>3</sub>-SCR catalyst by NaOH leaching and ion exchange processes**Chi-Lang Chen<sup>1</sup>, Chyi-Woei Young<sup>1</sup> and Yun-Hwei Shen<sup>2</sup><sup>1</sup>China Steel Corporation, Taiwan<sup>2</sup>National Cheng Kung University, Taiwan

The recovery and purification of vanadium (V) and tungsten (W) from honeycomb type spent selective catalytic reduction (SCR) catalyst was investigated using the NaOH leaching and ion exchange processes. Spent SCR catalyst mainly consists of TiO<sub>2</sub> and other oxides (6.37% W, 0.98% V, etc.). The NaOH addition, leaching temperature, leaching time and pulp density were varied during the leaching process. The optimal reaction conditions were identified for recovery of V and W. Under the optimum conditions (the NaOH addition of 0.3 Kg/Kg of catalyst, leaching temperature of 70 °C, reaction time of 30 min and the pulp density of 30%), the extraction efficiencies of Mo and V reached 88.5% and 91.2%. Additionally, separation of W from leachate containing 1710 ppm W, 397 ppm V and 971 ppm Si under pH 13.5 was investigated by the ion exchange method. The results indicated that W could be preferentially adsorbed onto a macro porous strong base anion exchange resin (Amberlite IRA900) under basic conditions of pH 13.5. The remaining Si in the effluent after ion exchange was reacted with HCl (pH=8.0) to form H<sub>2</sub>SiO<sub>3</sub> precipitates and separated from V. Consequently, V, W and Si could be recovered and separated successfully through the process in this study. On this basis a flow sheet for the proposed process of a complex utilization of spent SCR catalyst is presented.

**Biography**

Chi-Lang Chen has completed his MS from Department of Chemistry at National Taiwan University. He is currently a Scientist of chemical process & water treatment technology section within China Steel Corporation, the largest steel making company in Taiwan. He has published more than 25 papers and reports related to Catalyst Chemistry.

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