

Refining Waste Spent Hydroprocessing Catalyst and Their Metal Recovery

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Abstract : Catalysts play an important role in producing valuable fuel products in petroleum refining; but, due to feedstock's impurities catalyst gets deactivated with carbon and metal deposition. The disposal of spent catalyst falls under the category of hazardous industrial waste that requires strict agreement with environmental regulations. The spent hydroprocessing catalyst contains Mo, V and Ni at high concentrations that have been found to be economically significant for recovery. Metal recovery process includes deoiling, decoking, grinding, dissolving and treatment with complexing leaching agent such as ethylene diamine tetra acetic acid (EDTA). The process conditions have been optimized as a function of time, temperature and EDTA concentration in presence of ultrasonic agitation. The results indicated that optimum condition established through this approach could recover 97%, 94% and 95% of the extracted Mo, V and Ni, respectively, while 95% EDTA was recovered after acid treatment.

Keywords : atmospheric residue desulfurization (ARDS), deactivation, hydrotreating, spent catalyst

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