

## MANAGEMENT OF SPENT CATALYSTS IN PETROLEUM REFINERIES

Catalysts are used in the petroleum refining and petrochemical industry for the routine production of gasoline, diesel fuels, jet fuels, heavy oil, hydrocarbons, petrochemicals and plastics.

Hydrocarbons (HT and HDS) and residue hydro-desulfurization (RDS) are the major processes for converting crude oil into these petroleum products.

During processing, catalysts become contaminated with impurities in the crude oil feed and become deactivated. When that happens, they can be sent for regeneration and the contaminants are removed.

However, once they become contaminated with coke, sulfur, vanadium and nickel in a manner and at a level that makes regeneration impractical, they are considered "SPENT" AND THEY MAY POSE SIGNIFICANT ENVIRONMENTAL PROBLEMS. Landfill disposal is not considered the best way to take care of spent catalysts because they contain hazardous wastes.

Hydro-desulfurization (HDS/RDS) of heavy oil produces spent catalysts that contain molybdenum (Mo), vanadium (V), nickel (Ni) or cobalt (Co) at concentration levels that may be economical for recovery.

Due to its complex nature, metal recovery from HDS/RDS spent catalysts involves a combination of pyro- and hydro- metallurgical processes.