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## RESIDUES OF POLYCYCLIC AROMATIC HYDROCARBONS FROM REFINERY SPENT CATALYSTS

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### Abstract

Spent hydroprocessing catalysts from petroleum refining industries have been classified as hazardous wastes due to their content in heavy metal and persistent organic pollutants (POPs). The aim of our paper determine the polycyclic aromatic hydrocarbons (PAHs) residues contents in spent catalysts samples from four different units of the Romanian refinery Rompetrol Rafinare, Constanta: Hydrogen (H), Gas Desulfurization Sulfur Recovery (GDSR), Hydrofining Turbojet Kerosene (HTK) and Petroleum and Diesel Oil Hydrotreating (PDOH). Residual catalysts have been determined using high performance liquid chromatography (HPLC) technique with fluorescence detection (FLD), after the appropriate pretreatment consisting in extraction in acetone and petroleum ether, clean-up and reconcentration. The following polycyclic aromatic hydrocarbons have been found in concentrations range of 0.22-326.2 µg/kg: Naphthalene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(α)anthracene, Crysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(α)pyrene, Dibenzo(α,h)anthracene, Benzo(ghi)perylene and Indeno(1,2,3,-cd)pyrene. The total PAHs concentrations ranged in the spent catalysts refinery units as follows: 0.1264 mg/kg (in H unit), 0.1623 mg/kg (in GDSR unit), 0.461 mg/kg (in HTK unit) and 0.840 mg/kg (in PDOH unit). The PAHs quantification can further contribute to the assessment of the impact on human health of the spent catalysts products disposal.

*Key words:* fluorescence detection, HPLC, PAHs, refinery, spent catalysts

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