DETERMINATION OF TOXIC METALS IN COBALT-MOLYBDENUM CATALYSTS BY ATOMIC ABSORPTION SPECTROMETRY

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The toxic metals in the crude oil and petroleum products, exercise influence on the technological processes in its manufacturing. They act as catalysts' poison, cause corrosion of the equipment and falling into the fuels they have negative influence on the eco-systems.

Co-Mo catalysts are used in the petroleum industry in the hydro-desulfurization process with the aim to improve the quality of the fuels. It is known that Al₂O₃ as a base of these catalysts absorbs the compounds of V, Ni, Fe, Pb, As. This is the reason for reducing the activity and the selectivity of the catalysts, and meanwhile it makes their regeneration difficult. That is why the information about the content of catalysts' poisons is of interest for the technological practice.

In order to determine the content of toxic metals V, Ni and As in spent cobalt-molybdenum catalysts atomic absorption spectrometry is applied. There has been examined matrix interferences in flame determination of V and Ni and the elimination of these effects with application of proper spectrochemical buffers. As well as the influence of the high concentration of Al, Co, Mo in the matrix is evaluated to determine the As in graphite tube and the effect of various modifying agents. A temperature program is created which decreases the non-selective absorption without loss of As.

Because of that the toxic metals' concentration in spent catalysts varies in wide range – from mg kg⁻¹ to %, the accuracy of the analyses is evaluated by the method of standard addition, applied to prepared solutions, imitating the matrix.

1 References