

Recovery of spent molybdenum hydrofining catalyst on alumina support

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Annually at the oil refining enterprises a plenty of firm waste products catalysts are formed. They have worked their resource during hydroclearing oil fractions. Structure of catalysts contains about 6%–12% Mo, 35%–40% Al, 2.5%–3% Ni, that allows to consider them as secondary complex raw material. Recycling the waste catalysts is also the actual problem, demanding the decision from the point of view of protection of an environment from toxic industrial wastes. Baikov Institute RAS together with MISA have been investigated an opportunity of complex processing of the waste catalysts of hydroclearing and the process flowsheet, allowing to receive rare metals and aluminium oxide as commodity products is developed.

The offered technology is based on leaching the crushed material by a solution of a carbonate of sodium (40–50 g/L) at $S:L=1:10$, temperature 100–140°C and mixing. Molybdenum turns into solution as Na_2MoO_4 , where it is extracted from as ammonium paramolybdate with use of sorption on anion-exchange resin. The solid residuum after leaching is caked with a carbonate of sodium. Process is carried out at temperature 1200°C, molar ratio in charge $\text{Na}_2\text{O}/\text{Al}_2\text{O}_3=0.8$, within 1.5 hours. Cake is leached by a sodium-alkaline solution, at temperature 100°C. Alumina solution is carbonized. Received aluminum hydroxide serves as raw material both for obtaining of aluminium, and for the further synthesis of aluminum sulphate, hydroxosulphate or hydroxochloride-the coagulants, used at sewage cleaning. The residuum after cake leaching, concentrating nickel and other components of the catalyst can be sent for the further processing on the enterprises of ferrous metallurgy.