

Viktoria Peskova  
I.I. Kurmelyov, research supervisor  
V.V. Tykhonenko, language adviser  
SHEI «National Mining University», Dnipropetrovsk

### **On Problem of Coal Recovery**

Coal recovery is the differences in chemical, physical, and caking properties of coals of similar degree of carbonization and petrographic composition stipulated by the character of the initial vegetation and conditions of its transformation on initial stages of carbonization.

Recovered coals are characterized by increased content of carbon and decreased content of oxygen, much higher emission of volatile substances and better caking properties, higher combustion heat, and high emission of coking and semi-coking resins, much higher content of sulfur and basic oxides (mainly ferrous oxides), mineral impurities, decreased mechanical durability. According to the degree of coal recovery there are three (highly recovered, medium recovered, weakly recovered) or four (quite recovered, recovered, intermediate, slightly recovered) types.

Donetsk coalfield consisting of 1009 mining seams 734 of them (about 73%) are made up of coals of recovered type with sulfur content of  $>1,5\%$ . Coals of low degrees of metamorphism including long-flame ones with the increase sulfur content make up significant part of coal reserves of Ukraine.

Donetsk coals of recovered type ("B") differ with much higher content of general or pyrite sulfur comparing to weakly recovered coals ("a") irrespective of metamorphism degree. Peculiarities of sulfur distribution depending on the degree of recovery are found out in case of high-sulfur coals. At transferring from slightly recovered coals to the recovered one share of aliphatic structures increases and aromaticity level decreases.

More recovered coal always generate great amount of free-running products than the less recovered one. Content of carbides decreases in liquid nonvolatile constituents of less recovered coal but content of polycarbons at practically unchanged amounts of petrolenes and asphaltenes comparing to vitrinite of more recovered coal increases.

Here emission of volatile substances from liquid nonvolatile constituent is higher but their carbon content is lower than in slightly recovered coal that indicates its less thermal resistance and less molecular mass of liquid nonvolatile constituents being emitted from plastic mass of this coal.