

Lead in Coal Seams of Donetsk-Makeyevsky Donbass Region

To have objective assessment of the impact of the coal mining industry and heat-power enterprises upon the environmental situation and planning the most effective measures to make it better, it is necessary to have the data concerning distribution and level of concentrations of toxic elements, including lead, in coals and enclosing rocks being extracted.

The obtained results allow formulating the following conclusions:

1). There is statistically important relation of lead concentration in coals of the region with ash content, linear equation of regression:

$$Pb = 0,2189 + 0,803A^d$$

2). There is statistically important relation of lead concentration in coals of the region with general sulfure content, linear equation of regression:

$$Pb = 0,138 + 0,5963S_{\text{общ}}$$

3). Lead develops geochemical association with chromium and vanadium, linear equation of regression:

$$Pb = 0,03747 + 0,22927Cr, Pb = 0,02481 + 0,27589V$$

3). In general, the following things can be seen in all the studied seams: slight increase of lead concentration with the increasing degree of coal carbonization, the complication of the seam structures and a decrease in their thickness, increase of the number of interformational mineralized seams, fissility and the degree of coal recovery. Moreover, while seam splitting lead concentration is observed in less thick assise. For example, seam of n_1 within the mine field "Butovskaya" splits into two independent seams reservoir n_1^B и n_1^H . In the north-east area of the mine field upper low-thickness assise is more enriched with lead while in the south-east area lead is concentrated in the lower assise with less thickness.

4). Statistically important significant growth of lead concentrations within local areas of the seams with immediate aleurolit-argillite bedrock and argillite roof (for example, areas of seams l_1 and l_1^1 in mine field of "Proletarskaya Glubokaya" seam h_3 in mine field named after Gorky, seam k_7 in mine field named after Rumyantsev, sea h_{10} in mine field "60-letiya Sovetskoi Ukrainy" and named after Kalinin etc.).

5) As a rule lead concentration in coal along coal sections increases in the upper near-roof part.

6) Statistically significant decrease of lead content in coal seam areas being immediately adjacent to the intraformational washouts.