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### **Relation between Toxic and Minor Elements with Ash Content of Coals of South-West Donbas**

One of the main factors controlling distribution and determining the relations of the studied elements with the coal matter is ash content.

Straight positive dependences between the content of rubidium, cesium, chromium, gallium, molybdenum, vanadium, titanium, copper, ytterbium, lead, yttrium, barium, zinc, lanthanum, zirconium, scandium and nickel, on the one hand and ash content of coal on the other hand has been established in black coals of South-West Donbas.

Similar dependences have been established between the content of elements and ash content in anthracites of south-west Donbas.

Germanium content shows no immediate dependence on ash content. There is a weak link of more complex form, described with sufficient accuracy by parabolic equation.

Three main groups can be singled out depending in a degree of dependence of elements upon ash content:

- rubidium, cesium, chromium, gallium, molybdenum (correlation coefficient is from 0.6 to 0.8);
- vanadium, titanium, copper (correlation coefficient is from 0.5 to 0.6);
- ytterbium, lead, manganese, yttrium, zinc, lanthanum, zirconium, scandium, barium, nickel (from the largest random value  $r$  at  $\alpha = 0.05$  to 0.5).

According to the increasing strength of relation elements shown positive dependences with ash content in coals of South-West Donbas can be represented with the following range: Ni – Sc – Zr – La – Zn – Y – Ba – Pb – Yb – Cu – Ti – V – Mo – Ga – Cr – Cs – Rb.

According to mineralogical analysis most elements having shown positive association with ash content (rubidium, cesium, nickel, vanadium, chromium, barium, lead, ytterbium, zirconium, niobium, and cobalt) are contained in clay coal matter.

The possibility to predict the content of a number of elements (rubidium, cesium, gallium, chromium, molybdenum) with reasonable certainty based on mass determinations of ash content has been established for the first time.