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RESEARCH ON COAL WASTE HEAPS IN MINES IN THE NORTHERN DONBAS REGION

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The processes of spontaneous combustion in coal waste dumps in the Northern Donbas region have been studied, and the composition of toxic gases emitted during combustion has been determined. These gases seriously pollute all areas of the environment and prevent the recultivation of coal waste dumps by reducing their volume and utilising valuable components from them without compliance.
The foci of combustion and temperatures in the volume of one of the coal waste dumps were established in the range of 50-409 °C. It has been shown that at the surveyed mine, during the combustion of an average-sized coal waste dump, a particularly dangerous phenomenon of episodic ignition occurs, leading to the appearance of weak solutions of sulphuric, carbonic and other acids in its volume.
On average, 10.8 kg of CO and 0.5 kg of SO_2 are emitted from 1 tonne of burning rock mass in the Donbas mine dumps. Even in extinct dumps, these compounds remain for a long time. Extremely dangerous and dangerous categories of fires are characterised by a complex structure and occupy significant areas. They have one or more epicentres corresponding to the location of the sources of ignition and the location of containing and associated rocks.
At the same time, the following substances are released into the atmosphere in the area of the surveyed mine per year: SO_2 – 168.6; Zn – 91.3; NO_x – 14; H_2S, hydrocarbons, Hg, Be, Co, HCN compounds. Analysis of the spread of hazardous pollutants, including compounds of heavy and rare metals, indicates that the region's soils exceed the maximum permissible concentrations for: Zn (up to 435 MPC), As (up to 100 MPC), Pb (56 MPC), Cd (up to 1).
A number of inexpensive and readily available recipes have been proposed for creating protective layers of antioxidants (antipyrogens) that prevent oxygen from reaching the combustion sites of coal waste dumps and the formation of toxic gaseous compounds, as well as prevent secondary dusting from the surface of a burning coal waste dump.

Keywords: coal dumps, slag heaps, burning dumps, antioxidants, environmental pollution, temperature in combustion cells, antipyrogens.

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