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### **INCREASING THE LEVEL OF ENVIRONMENTAL SAFETY DURING THE BLASTING OPERATIONS FORMING THE RESOURCE-SAVING CHARGE**

The aim of the research – increasing the level of environmental safety during the blasting operations forming the resource-saving charge using zeolites to form the damper zone between borehole and rock mass.

Object of research – process of environmental pollution as a result of mass explosions in the quarries of non-metallic minerals. Subject of research – reducing the level of environmental pollution during the application of advanced charge design using zeolites to create a buffer zone between borehole and rock mass.

Research tasks:

- to analyze the current technologies of minimizing the impact of explosive destruction of rocks on the environment and ways of increasing the level of resource conservation during the development of mineral deposits in an open way;
- to establish the regularities of the pressure waves passage during the explosion, depending on the characteristics of the zeolite;
- to determine the quantitative and qualitative characteristics of zeolite depending on the type of explosive, the amount and type of harmful gases it produces during the explosion, and the parameters of the borehole;
- to calculate the ecological and economic effect of its introduction into production.

Content of scientific work:

- analysis of the current technologies of minimizing the impact of explosive destruction;
- methodology and methods of research;
- increasing the level of the environmental safety of blasting on the rock quarries by the improvement of the charge construction;
- startup project on pollutant emissions reducing and resource conservation during blasting.

The expected charge structure is shown in Figure 1.

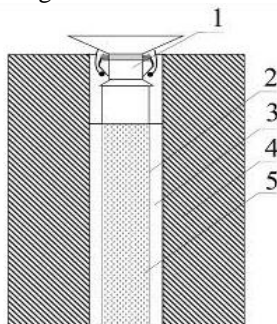


Figure 1 - Developed charge structure

1 - device for feeding a plastic sleeve; 2 - plastic sleeve; 3 - the gap between the charge and the wall of the borehole filled with zeolite ; 4 – rock mass; 5 - explosive

Expected scientific value of the results:

- establishing the regularities of the pressure waves passage during the explosion, depending on the characteristics of the zeolite;
- determining the quantitative and qualitative characteristics of zeolite depending on the type of explosive, the amount and type of harmful gases it produces during the explosion, and the parameters of the borehole.

Expected Practical value of the result: forming the resource-saving charge using zeolites to form the damper zone between borehole and rock mass for increasing the level of environmental safety in mining enterprises.