



## Mechanoelectrical transformations in ores.

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The electromagnetic radiation (EMR) of radio frequencies is registered during passing of elastic waves through pollymetallic ore bodies. The mechoelectrical transformations were studied in mines on exposure of two types: 1) galenite-sphalerite ore body, which occurs into skarn limestone; 2) loparite ore body relating to formation of the loparite- bearing nepheline syenite. This syenite contains rare-earth metals and radionuclides. The EMR signals ( $0.04 \div 2.8$  MHz), generated by elastic waves and electrostatic charges ( $q$ ), in correlation with  $\gamma$ -radiation ( $5 \div 500$  keV,  $0.4 \div 10$  MeV) and neutrons were analyzed. The electrometer and the sensors of  $\gamma$ -radiation have been fixed on a surface of ore apart 5 mm. The sensor of neutrons have established in a blast hole without contact with walls. The elastic waves were excited by detonation of charges of weight up to 3 kg, which were realized in parallel excavation,  $14 \div 17$  m from ore body. An elastic wave was controlled by piezo-electric seismograph. The maximum energy of elastic waves in ore body was registered in frequency band  $f = 1.7 \div 3.5$  kHz. The experiments show that the field strength EMR in a source (ore) reached up to  $E \approx 10^5$  V/cm, relaxation of a pulse  $t_{rel.} \approx 4 \div 150 \cdot 10^{-6}$  seconds. They are accompanied by relaxation oscillations. The electrostatic positive charge on contacts of ore was equal to  $q \approx 7.2 \cdot 10^{-12}$  C/cm<sup>2</sup> with  $t_{rel.}$  from  $3 \div 8$  until  $20 \div 22$  seconds. The increase of  $\gamma$ -activity and neutrons was detected, that appears in  $t = 1.5 \div 2$  ms after arrival of an elastic wave to ore body. The increase of  $\gamma$ -radiation greater in  $1.5 \div 3$  times than background value have been registered in energy intervals of the natural radioactivity  $\text{Th}^{232} - 2.615; 0.860; 0.583; 0.277$  MeV, and sometimes with  $\text{E}^{40} - 1.46$  MeV and  $\text{U}^{238} - 0.769; 0.609$  and  $0.352$  MeV. The increase of quantity of neutrons on  $25 \div 30\%$  is registered at the same time. Complex mechoelectrical transformations stimulate one another. It essentially distinguishes described experiments from laboratory researches. Samples taken out from ore body are loss of generality of mechoelectrical, chemical and other connections with a volume of ore

and containing rock of natural bedding.