

SPECIAL FEATURES OF COMPOSITION OF LUNAR BASALTIC ROCKS BY NEUTRON ACTIVATION ANALYSIS

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Instrumental Neutron Activation Analysis has been undertaken for the detailed studies of the chemical composition of lunar basalts. The samples supplied from automatic space station "Luna-16" and "Luna-24" are characterised with high (8% TiO₂) and low (0.8% TiO₂) contents of titanium and high content of aluminium (18% Al₂O₃).

For the purpose of reliable data on the biggest element number the analysis of the samples have been made by two stages - by short-lived radionuclides using pneumatic system and by long-lived radionuclides with integral neutron flux of $2.2 \cdot 10^{15}$ n·cm⁻² and $8.6 \cdot 10^{17}$ n·cm⁻², respectively. The samples weighed 0.5-10 mg. Activity measurements were carried out with gamma-ray spectrometer with Ge(Li) semiconductor detector of high resolution and with 4096-, 8192-channel analyser. Spectrometric data were processed using computer. Results of Al, Ca, Mg, Na, Ti, Dy, V, Mn, Eu elements were obtained at the first stage and results of Fe, Cr, Co, Sc, Zr, Hf, Ta, Rb, Cs, REE and other elements obtained in the second stage (on the whole 40 elements with 3-15% error were determined). Graphical correlations of geochemically identical rock samples were made using computer.

Correlation depending on comparison for pair of elements of "Luna-16" and "Luna-24" rocks points out the differences of two series to the distribution of REE, Ba, Zr, V and other elements and two stage (phase) formation of magma from Mare of Fertility. Basalts of "Luna-24" are characterised with lower contents of incompatible elements in comparison with the other lunar basalt samples collected from different regions of moon including Mare of Fertility. Low level contents of trace and rare earth elements observed in the rocks of "Luna-24" suggests the weak geochemical variations of magma in Mare of Crisium.

Similar types of investigations were also made with the samples which are supplied from spaceship "Appolo".