



Analyzer of apatite-nepheline ores in the field

On the basis of Tagged Neutron Method

Application features

- The rock analyzer AGP-F is designed for the express determination of the mass concentration of phosphorus pentoxide P_2O_5 in samples of apatite-nepheline ore.
- Does not require any preliminary preparation of samples.
- Size of the sample: -100 mm.
- Weight of the sample: 3–5 kg.
- Permissible mass fraction of water in the samples – up to 7%.

Operation principle

- Irradiation of samples with a beam of 14 MeV tagged fast neutrons and registration of gamma quanta from inelastic scattering reactions.
- The source of fast neutrons is a portable neutron generator. Gamma quanta are registered by scintillation detectors based on a BGO crystal.

Configuration

- AGP-F includes a neutron module, an electronics crate and an operator's workplace.
- For use in the field, the unit is housed in a heated container.



Neutron module
and electronics crate

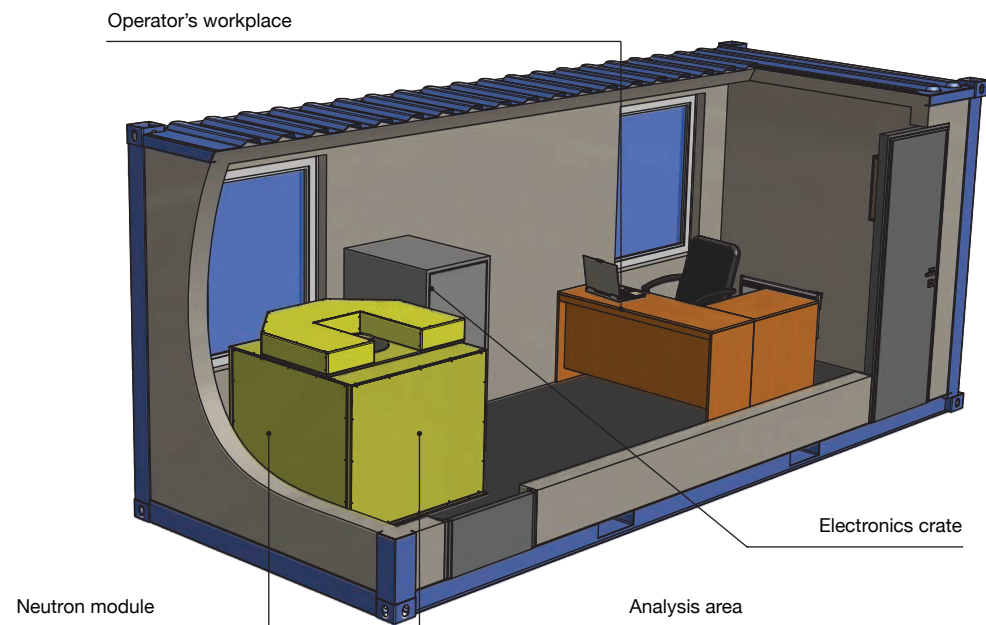
Application area

- The range of P_2O_5 concentration – 2–40%.
- Precision of the P_2O_5 concentration determination at a confidence level of $P=0.95$ (range 2 σ) is $\pm 2.18\%$.

Specifications

Neutron source	Portable neutron generator ING-27 with an alpha detector
Neutron energy	14 MeV
Neutron beam intensity	5×10^7 n/c
Number of tagged neutron beams	9
Gamma detection system	12 gamma-ray detectors based on a BGO crystal
Power requirements	Three-phase 380 V +/- 10%
Power consumption of the neutron module	No more than 300 W

General view of AGP-F facility in a container



Approbation

- Field tests of the AGP-F analyzer were carried out at a mine of JSC "Apatite".
- There is an expert opinion of the Institute of the Earth's Crust of the SB RAS.
- There is an expert opinion of Rospotrebnadzor on the lack of activation of the controlled object and environmental objects above the background level during the analysis.

Internal view of the container



ДИАМАНТ

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