

36. 14 MeV NEUTRON ACTIVATION ANALYSIS OF SELECTED LEG 6 CORE SAMPLES

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SAMPLE PREPARATION

Each core sample was first crushed and mixed to permit packaging in small polyethylene vials. Where sample size permitted, two sub-samples weighing approximately 1 gram each were taken at random from the core sample, weighed and placed in vials, which were then heat sealed. Standards containing known amounts of oxygen, silicon, iron, magnesium, potassium and aluminum were weighed and capsulated. Samples of the U.S.G.S. standard rocks G-2, BCR-1 and GSP-1 were weighed and capsulated in a similar manner.

ANALYTICAL PROCEDURES

Each sample and standard was irradiated with 14 MeV neutrons for two minutes, counted for two and ten minutes after cooling times of ten minutes and two hours, respectively. A Cockcroft-Walton-type neutron generator provided a fast neutron flux of approximately 1×10^8 n·cm⁻²·sec⁻¹ at the sample during irradiation. A pneumatic sample transfer system was used to carry each sample and standard to the irradiation terminal

and then to a 3 inch × 3 inch sodium iodide (T1) detector which was coupled to a 400-channel pulse height analyzer. KRIS, a weighted least-squares computer program, processed the punched-tape data from the pulse height analyzer to resolve the radioactivity from the activation products of silicon, aluminum, iron, magnesium and potassium, and also to compute the amount of each element present. A goodness-of-fit parameter was computed for each unknown sample, and it serves as an indication of the reliability of the final results.

Oxygen content was determined by a separate procedure which consisted of five short irradiations and counts under standardized conditions. The observed activity was then compared to that of oxygen standards by a computer program written to facilitate the quantitative calculations and to provide an error estimate.

This work was carried out with partial funding support under the NSF Sea Grant, Institutional Grant GH-26, made to Texas A&M University.

Major Element Composition of Selected Core Samples from Leg 6

Sample Designation				Composition, Wt % (Average of results on duplicate samples is reported).					
Hole	Core	Section	Sampled at (cm)	O	Si	Fe	Al	Mg	K
45.1	1	3	30	45.7 ± 2.6	23.1 ± 1.2	5.1 ± 0.5	6.7 ± 0.7	2.4 ± 0.20	5.49 ± 0.5
46.0	1	1	145-150	42.2 ± 1.8	24.9 ± 1.2	2.8 ± 0.3	7.5 ± 0.8	0.5 ± 0.05	10.28 ± 1.0
50.1	3	1	145-150	43.4 ± 1.5	26.9 ± 1.3	5.7 ± 0.6	8.3 ± 0.8	2.1 ± 0.20	7.02 ± 0.7
51.1	1	2	20	48.5 ± 3.7	29.9 ± 1.5	5.6 ± 0.6	8.3 ± 0.8	1.5 ± 0.20	8.19 ± 0.8
52	8	2	145-150	46.3 ± 2.0	32.9 ± 1.6	4.1 ± 0.4	4.6 ± 0.5	1.3 ± 0.10	6.77 ± 0.7
53.1	2	1	145-150	43.6 ± 0.9	29.9 ± 0.9	5.0 ± 0.5	7.6 ± 0.8	1.3 ± 0.10	3.93 ± 0.4