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Classification of igneous rocks from Paraguay by INAA

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Plutonic and volcanic rocks were analyzed by INAA in their major components for its classification. The samples proceed from the sites/regions corresponding to the Precambrian to Paleozoic/Postpaleozoic magmatism in the Eastern and Western Paraguay. In the Eastern Region the Precambrian is present in two structural highs: the Apa Hight in the north and Caapucu in the south. The latter is constituted by Rio Tebicuary complex; of upper Proterozoic age. In the Western Region, Precambrian outcrops occurred in the north in the Alto Paraguay Province. Six main magmatic events constitute the Paleozoic/Postpaleozoic magmatism: the eldest one (Alto Paraguay Province) is dated at Permo-Triassic. The second is dated as Cretaceous at the north of Eastern Paraguay. The third one also Cretaceous, is exposed by extended lava of tholeiitic basalts of the Alto Paraná Formation/Serra Geral. The fourth event, occurred in the Asunción-Sapucaí Graben. The fifth, in the Misiones Province near San Juan Bautista mainly by sodic-alkaline plugs and dykes. The sixth, from the Paleocene, is concentrated in the Asunción region.

The activation were performed in an annular ^{252}Cf Am-Be neutron source. The analysed elements were Si, Al, Na and K and thus the SiO_2 , Al_2O_3 , Na_2O and K_2O content determined. The reactions used were i) ^{28}Si (n,p) ^{28}Al ; ii) ^{27}Al (n,p) ^{27}Mg iii) ^{23}Na (n, γ) ^{24}Na ; the fourth element of interest, potassium, was analysed by simple gamma spectrometry. The procedure overall uncertainties were checked as per the irradiation of three composite samples of $\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{NaHCO}_3 + \text{K}_2\text{CO}_3$ prepared as standards in convenient proportions. The determination of these parameters permit the classification of the rocks in the categories acid, intermediate, basic and ultrabasic, as well as the identification of the rock family and in certain cases the norm and their magmatic provenance.

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