2704432

AGE OF THE PARANÁ CONTINENTAL FLOOD BASALTS USING ^{187}Re-^{187}Os SYSTEMATICS

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A suite of basaltic rocks sampled over a vast exposure in the Paraná continental flood basalts (PCFB; [1]) has been investigated for Os isotopic systematics, also including olivine phenocrysts of Spitzkoppe picrites of the Etendeka[2]. Rhenium and osmium concentrations for basalts vary between 0.55 and 1.1 ng/g and 0.033 and 0.13 ng/g, respectively. The $^{187}Re/^{188}Os$ ratios for basalts range from ~30 to 90. The olivine phenocrysts have: [Re] = 0.18 and 0.27 ng/g; [Os] = 1.05 and 0.84 ng/g; $^{187}Re/^{188}Os$ = 0.81 and 1.55. On a plot of $^{187}Re/^{188}Os$ versus $^{187}Os/^{188}Os$, the Re-Os data for 13 samples of both high- and low-Ti basalts, and olivine phenocrysts form a linear trend with a slope that corresponds to an age of 134.2 ± 2.4 Ma (MSWD = 19) and an initial $^{187}Os/^{188}Os$ = 0.1271 ± 0.0019. The ^{187}Re-^{187}Os age is in agreement with previous results based on the $^{40}Ar/^{39}Ar$ plateau (134-132 Ma) method and U-Pb (134.3 Ma) dates. As we obtain a well defined isochron for the PCFB' basalts and Etendeka' olivine phenocrysts, implies that the source of the magmatism was isotopically homogeneous over the geographic extent and the duration of the volcanism. Also, if we add to our model one basalt (average of 7 duplicates) of the PCFB, with $^{187}Re/^{188}Os \leq 100$ (uncertainty in initial $^{187}Os/^{188}Os$ is<3%), published by [3], we obtain a Re-Os age of 134.0 ± 2.4 Ma (MSWD = 19) and an initial $^{187}Os/^{188}Os$=0.1270 ± 0.0019. These initial $^{187}Os/^{188}Os$ overlap with the range of compositions observed for the convecting upper mantle. It also overlaps with the compositions of fertile SCLM xenoliths from the spatially associated Goiás Alkaline Province. Additional analysis of the Ribeira magma-type (in progress), which was not already investigated for Re-Os, will shed further light on the generation of the PCFB, particularly its northwestern portion. [1] Rocha-Júnior et al. (2012) Earth Planet. Sci Lett. 337-338: 164-173 [2] Thompson et al. (2007) J. Petrol. 48: 1119-1154 [3] Correia et al. (2011) Cong. Bras. Geoquímica, 1143-1146.