Geothermometry of dacitic rocks of Moalleman, South of Damghan, North Iran

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The study area is located in south of Damghan in Semnan province, N Iran. There is a magmatic belt with northeast–southwest trend in this area, consisted mainly of Eocene extrusive rocks with basalt to dacite composition and intusive igneous rocks. This belt is limited between Torud sinistral strike slip fault in south and Bagho strike slip fault in north and lies at the northern end of the Central Iran structural zone. The dacitic rocks are observed in the field as welded tuffs and lava flows. The main minerals in these rocks are plagioclase, biotite, and sanidine. Biotite is a significant ferromagnesian mineral in most intermediate and felsic igneous rocks and can be used to provide valuable petrogenetic information [1]. Based on results of electron microprobe analyses, biotite in dacitic rocks of north of Moalleman area, show phlogopite-annite composition with a tendency toward phlogopite end-member, and plot in the field of calc-alkaline of FeO*-Al_2O_3 biotite discriminant diagram. Geothermometry of these rocks, using the Fe/(Fe+Mg) ratio of biotite, and feldspar compositions, gives altimate equilibration temperatures ranging from 750 to 860°C.

[1] Abdel-Rahman (1994) *Journal of Petrology* **35**, 525-541.

Latitudinal position of Indian Plate during Phanerozoic period; revealed based on abundances of ^{13}C-^{18}O bonds in palaeosol carbonates

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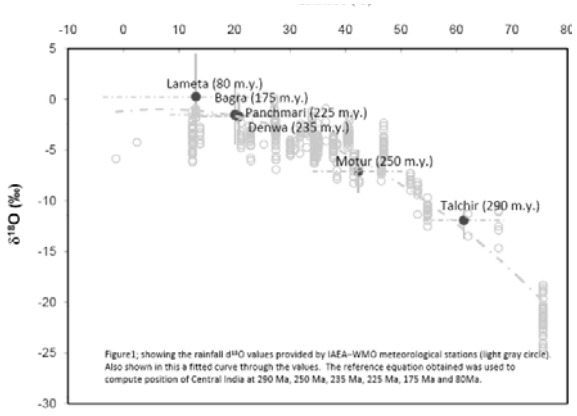
The paleo-latitude of the earth's surface is among the most difficult coordinate to reconstruct from the geological archives. We describe clumped isotope analyses using Delta^{plus}XP (1) to paleo-latitudinal reconstruction based on independent and simultaneous determination of temperatures of carbonate formation and the oxygen isotope compositions of soil water, constrained by measurements of abundances of ^{13}C-^{18}O bonds in Satpura paleosol carbonates (2). Here we plotted latitudinal variations in $\delta^{18}O$ of average rainfall from Southern hemisphere and establish an empirical relationship between $\delta^{18}O$ and latitude. The equation was used to estimate position of Indian plate from oxygen isotope compositions of estimated soil water. Here we present result on latitudinal position of Central India during 290 m.y., 250 m.y., 235 m.y., 225 m.y., 175 m.y. and 80m.y. Our results show that the Indian plate has migrated from 61±7°S during Permo-carboniferous (290 m.y.) to 40±10°S latitude during Late Permian period (250m.y.) to 21±10°S during middle Triassic (235m.y.). This suggests a high rate of displacement between 290 m.y. and 235 m.y., followed by a major drop in movement of Indian plate between late Triassic and Late Cretaceous period.



[1] Ghosh, Ghosh, & Bhattacharya (2001) *Palaeo. Palaeo. Palaeo.* (2001) **170**, 285-296. [2] Ghosh *et al.* (2006) *Geochim Cosmochimica Acta* **70**, 1439-1456.