Linking NW India to South China in Rodinia by low δ^{18} O rhyolites of the Neoproterozoic Malani Igneous Suite

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Voluminous silicic lavas (~17850 km^3) of the Malani Igneous Suite (MIS) erupted between ca. 780-760 Ma, based on SIMS zircon U-Pb dating. Zircons from rhyolitic and dacitic lavas have oxygen isotopic compositions that include depleted ($\delta^{18}O$ = 4.12 to -1.11 ‰) and enriched ($\delta^{18}O$ = 8.23-5.12 ‰) values. The low $\delta^{18}O$ zircons have highly radiogenic Hf isotopic compositions ($\varepsilon_{Hf(t)}$= +13.0 to +3.6), suggesting high temperature bulk cannibalization of upper level juvenile crust was the essential mechanism to produce the low $\delta^{18}O$ felsic magma. Xenocrystic zircons in dacite have high $\delta^{18}O$ values for magmas older than 800 Ma, whereas 795 Ma magma has mantle-like Hf-O isotopic compositions, reflecting a dramatic tectono-thermal transition between 800-780 Ma in NW India. Magmatic activity occurred in an overall setting of lithospheric extension. A synchronous transition occurs in the South China Block at around 800-780 Ma, suggesting a spatially linked geodynamic system. NW India and South China together with Madagascar and the Seychelles lay along the periphery of Rodinia, forming in an overall convergent plate setting and overlapping with breakup in the interior of the supercontinent.