

## **PETROLOGY AND GEOCHEMISTRY OF DOLERITE AND LAMPROPHYRE SILLS IN MESOZOIC SUCCESSIONS OF WESTERN SULAIMAN FOLD–THRUST BELT, PAKISTAN**

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### **Abstract**

In Western Sulaiman Fold–Thrust Belt, NW Pakistan, the sills are intruding mainly Triassic–Jurassic successions of Indian platform sediments. They are petrographically identified as dolerites and lamprophyres. The dolerites are texturally basaltic, doleritic and gabbroic and are altered compare to lamprophyres. Lamprophyres are classified as sannaite, comptonite, minette and damtjernite. Geochemical signatures of dolerite, olivine dolerite and lamprophyres suggest that these rocks belong to alkali series by classification, may be alkaline in nature. Normal mid oceanic ridge basalts (NMORB)–normalized plots of dolerites, olivine dolerites and lamprophyres show higher enrichments of large ion lithophile elements (LILEs) relative to high field strength elements (HFSEs) and marked positive anomalies on Nb which confirm their origins from an enriched mantle source. While the ocean island basalt (OIB)–normalized plots of these rocks exhibit patterns almost alike to those of OIB suggesting a source similar to OIB. The tectono-magmatic discrimination plots of dolerite, olivine dolerite and lamprophyres plots them in OIB field and indicate that they are alkaline rocks in nature. Petrogenesis and tectonic setting of these rocks suggest that they are OIB type in nature and may represent the Late Cretaceous magmatic activity that erupted as hotspot fluid through the crust of Indian Plate during Late Cretaceous. It is much similar to other hot spot related rocks that intruded Parh Group and Bela Ophiolite mélange. It is concluded that such as the magmatism of Deccan trap and the Chagos-Laccadive ridge, these rocks may be the melt of a hotspot possibly Reunion that intruded the Indian Plate margin when it had passed over it during Late Cretaceous.

**Keywords:** Dolerite, lamprophyre, sills, alkaline, Petrogenesis, tectonic setting