

## **Beni Bousera Orogenic Peridotite (Northern Morocco): New Insights From Geochemistry Of Pyroxenites And Implication For Their Origin**

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The Beni Bousera peridotite (Morocco) contains a diversity of pyroxenite layers, and several studies have postulated that at least some of them represent elongated strips of oceanic lithosphere recycled in the convective mantle (the Marble Cake model). Some pyroxenites were however interpreted as high-pressure crystal segregate or melt-rock reaction products. To further constrain the origin of these rocks, 170 samples were collected throughout the entire massif and examined their variability in relation with the peridotite tectono-metamorphic domains. A major finding is that all pyroxenite facies showing geochemical evidences for a crustal origin are found only in a narrow (< 100m) corridor of mylonitized peridotites, along the contact with crustal rocks. These peculiar facies therefore do not represent recycled components from the convective mantle and were most likely incorporated at the mantle-crust boundary during the massif exhumation. Other types of pyroxenites derive from a clearly distinct pyroxenite protolith that was ubiquitous in the peridotite body before its exhumation. However, these layers do not show evidence for a crustal origin and thus do not lend support to the Marble Cake model either. Formation of these pyroxenites probably involved igneous refertilization mechanisms. They were thereafter deeply modified by partial melting and melt-rock reactions associated with lithospheric thinning in a supra-subduction setting.