NEAR-ULTRAHIGH PRESSURE PROCESSING OF CONTINENTAL CRUST: MIOCENE CRUSTAL XENOLITHS FROM THE PAMIR

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Xenoliths of subducted crustal origin hosted by Miocene ultrapotassic igneous rocks in the Southern Pamir provide important new insight into the fate of subducted continental slabs at high temperature and pressure. Four types have been studied: sanidine eclogites (omphacite, garnet, sanidine, quartz, biotite, kyanite), felsic granulites (garnet, quartz, sanidine and kyanite), basaltic eclogites (omphacite and garnet), and a glimmerite (biotite, clinopyroxene and sanidine). Apatite, rutile and carbonate are the most abundant minor phases. Hydrous phases (biotite and phengite in felsic granulites and basaltic eclogites, amphiboles in mafic and sanidine eclogites) and plagioclase form minor inclusions in garnet or kyanite. Solid-phase thermobarometry reveals recrystallization at mainly ultrahigh temperatures of 1000 - 1100 °C and near-ultrahigh pressures of 2.5 2.8 GPa. Textures, parageneses and mineral compositions suggest derivation of the xenoliths from subducted basaltic, tonalitic and pelitic crust that experienced high-pressure dehydration melting, K-rich metasomatism, and solid-state re-equilibration. The timing of these processes is constrained by zircon ages from the xenoliths and ^{40}Ar / ^{39}Ar ages of the host volcanic rocks to 57 - 11 Ma. These xenoliths reveal that deeply subducted crust may undergo extensive dehydration-driven partial melting, density-driven differentiation and disaggregation, and sequestration within the mantle. These processes may also contribute to the alkaline volcanism observed in continent-collision zones.