Microcrystalline silica in Deccan Flood Basalts, Killari, Maharashtra, India.

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Microcrystalline fibrous silica occurs as amygdaloidal and vein fillings besides zeolites in the ~ 65 Ma old Deccan Flood basalts. The samples were collected from a depth of 122 meters in a bore hole passing through the Deccan basalts at Killari (18^0 03' N and 76^0 33' E) in Maharashtra, India. Powder x-ray diffraction studies showed at least seven diffraction peaks corresponding to the structure of a novel silica polymorph " moganite", with lattice parameters a = 0.4334nm; b= 1.0761 nm; c= 0.8533nm; and $\beta=92.3^0$ in addition to quartz. Thermogravimetry indicated moganite content up to 80 wt%; both thermogravimetry and FT-IR spectroscopy pointed to the presence of hydrous component in the moganite phase. Solid state MAS ^{29} Si NMR spectroscopy showed a unique peak at -107.65 ppm for moganite. Moganite of Killari was found to be associated with amygdaloidal flows having chabazite, natrolite, heulandite and mordenite, but were absent in flows with laumontite, indicating the stability of moganite up to laumontite zone.