High-pressure phases in L6 chondrites Dhofar 717 and 864

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Dhofar 717 (6 g) and Dhofar 864 (1233 g) are among wide range of L6 chondrites found in Oman in 2001-2002. The host-rock minerals are olivine (Fo_{25-26}), orthopyroxene ($En_{77}Fs_{21.5}Wo_{1.5}$), clinopyroxene ($En_{47}Fs_{8}Wo_{45}$), plagioclase ($Ab_{83}An_{9}Or_{8}$), chromite, apatitle, troilite and Fe- Ni metal. The host-rock is cut by the abundant shock-melt veins (SMVs). They were studied in details by scanning and transmission electron microscopy and Raman spectroscopy. The SMVs contains fragments of host-rock mineral grains and aggregates, most of which has been transformed to high-pressure phases. High-pressure minerals are also abundant in the vicinity of the SMVs. Olivine close to the veins is transformed to wadsleyite and ringwoodite, whereas inside the SMVs it is totally replaced by wadsleyite-ringwoodite or ringwoodite aggregates. The SMV background is presented by fine-grained majorite, ringwoodite and metallic phases. Plagioclase grains are transformed to jadeite-lingunite aggregates, however most of them are presented by fine-grained jadeite. Some jadeites are rimmed by high-Ca majorite. Orthopyroxene is transformed to majorite, akimotoite and vitrified glass after Mg-perovskite. Apatite is replaced by fine-grained tuite aggregates, whereas merrillite at the boundary of the SMVs remains untransformed. Broad range of high-pressure minerals indicates heavy shocked conditions for studied meteorites with relevant pressures above 20-25 GPa with strong heterogeneity. Textural observation indicates presence of melting structures of olivine and plagioclase and may correspond to the temperatures above 2500 K. Akimotoite and other features after orthopyroxene indicate solid state transformation.
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