EGU22-10678, updated on 09 Aug 2022
https://doi.org/10.5194/egusphere-egu22-10678
EGU General Assembly 2022

New insights into the formation of the pallasites from the Sericho meteorite from EBSD.

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The pallasite meteorites are composed of olivine crystals, Fe-Ni metal alloy and Fe-sulphide. Their formation environment was initially proposed to be at core-mantle boundaries of planetesimals (Scott et al., 1977., *Geochemica et Cosmochemica Acta*., p.349). However, recent studies using paleomagnetic techniques, and examining the metal concentrations across multiple pallasites, argues against the core-mantle boundary hypothesis (Nichols et al., 2021., *Journal of Geophysical Research Planets*., p.16). Ferrovolcanism models, which invoke Fe-FeS magma injection into mantle lithologies support paleomagnetism results, compositional trends, and olivine growth conditions (Johnson et al., 2020., *Nature Astronomy*., p.43). Here we present results from the recently found pallasite Sericho to further explore magmatic aspects of the ferrovolcanism hypothesis using optical microscopy together with SEM energy dispersive X-ray spectrometry (EDS) and electron backscatter diffraction (EBSD).

Sericho has a jigsaw-like texture of forsterite crystals in a troilite matrix. Crystallographic preferred orientations (CPO) of the olivine as determined by EBSD indicate a flow alignment, possibly due to the introduction of the Fe-Ni alloy resulting from upwelling within the planetesimal. Identification of a tabular inclusion within one of the olivine crystals suggests that Sericho experienced mild shock events in contrast to previously studied pallasites including Eagle Station. Our CPO results support the ferrovolcanism hypothesis and more work is underway to investigate olivine slip systems to find out type of internal misorientation is recorded within Sericho's olivines.