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# Melt textures produced by impact events and compositional variations in L6-chondrite (Putinga)

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Chondritic meteorites are excellent tools for understanding planetary and Solar System evolution. The Putinga meteorite fell on Putinga city, southernmost Brazil. It is classified as a L6-S5 ordinary chondrite, meaning it has been through intense and frequent shock events that have altered primary features of the chondrite.

A thin section of the chondrite was analysed using optic microscopy, scanning electron microscope (SEM) and electron microprobe. Raman spectroscopy technique was also applied for seeking high pressure phases and current studies involving Rb-Sr and Sm-Nd isotopes are being performed.

The optic microscopy revealed ubiquitous fracturing, both irregular and planar. Opaque veins and mosaicism are other shock related features observed. SEM revealed the presence of melt pockets (Figure 1). They display liquid immiscibility characteristics, where two different phase compositions, mostly silicate and sulphide, are present.

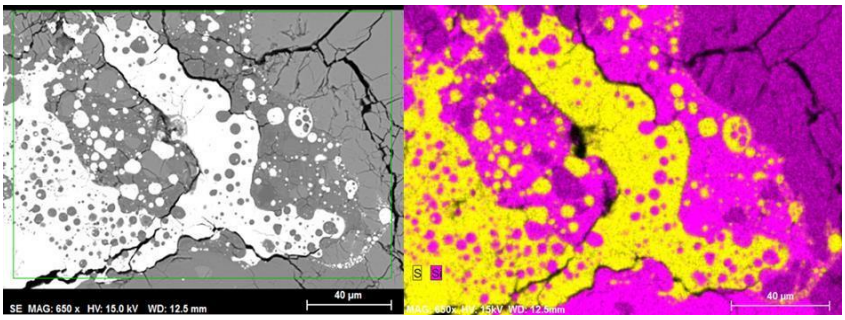


*Figure 1: BSE image of a melt pocket in Putinga L6 chondrite (left). Compositional EDS map showing sulfur in yellow and silicon in pink (right).*

Plagioclase with fracturing absent was also observed. Its composition varies from albite to oligoclase and is often associated with aluminium-chromite. Calculated olivine and pyroxene end-members average is $Fa_{24,6}$ and $Fs_{21,07}$ respectively, in agreement with previous measurements [1] [2].

From 25 different spectrums, the Raman Spectroscopy data did not reveal significant variations in the structure of olivine considering low-high pressure phase transformation in this chondrite. The obtained data is consistent with forsterite rather than ringwoodite.

Chemical evidence suggests that the shock events are probably responsible for remobilizing and fractionating elements in meteorites, possibly having an important role in planetary differentiation.

*References:*

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