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A synchrotron study of presolar graphite spheres.

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Various studies have shown that presolar graphite spherules (CS) can capture refractory stellar Carbide grains while they condense in circumstellar environments. In a few cases hundreds of these refractory phases are enclosed [1].

Here we report a new attempt to apply non-destructive, high-resolution (<100nm) *in-situ* synchrotron XRF and XRD on a single high-density and two low-density CS from Orgueil separates [2]. The high-density grain only shows features that are supposed to be located on the surface of the CS whereas the two low-density grains show a large number of enclosed (Ti,V)-rich sub-particles with varying sizes and distribution that are supposed to be Ti-carbides. One of these CS shows a central Ca-, Si-rich cloud in which Ti-rich sub-particles are partly enclosed. To identify which sub-particles are located inside the CS and which are on the surface, thus representing possible contamination, a pseudo 3D view was constructed based on two different scanning angles of the sample.

[1] Croat et al. 2003 GCA, 67, 24, 4705–4725. [2] Jadhav
et al. 2006 New Astron. Rev., 50, 7-8, 591.

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