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FT-IR SPECTROSCOPY OF CAI AND CHONDRULES IN
PRIMITIVE CHONDRITES: TECHNIQUES AND FIRST
RESULTS
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Introduction: CAIs and chondrules are the earliest macro-
components formed in the solar system, and are thus an important
step in the formation of larger bodies: They are also a significant
stage in the evolution of interstellar dust to planets.

Here we present preliminary mid-infrared spectra of CAI,
chondrules and matrix from the CV3.2 carbonaceous chondrite
Allende. This is part of our ongoing project to compile a database
of infrared and optical spectra of minerals and components of
primitive meteorites. These spectra should allow a better com-
parison with spectra from astronomical sources e.g. from dust
and molecular clouds or young solar systems.

Techniques: First, chondrules and CAI were handpicked
from gently crushed sample of Allende. The components were
cleaned with alcohol and dried. For the analyses, selected chon-
drules and fragments of CAI were crushed with an agate mortar
or a diamond compression cell to a fine powder (the Allende ma-
trix material was used without grinding). The CAI was also char-
acterized with XRD for its mineralogical composition. The infra-
red spectra have been taken with a Perkin Elmer Spectrum One
workbench, using the Diffuse Reflectance Accessory. The pow-
dered material was put on a metal coated abrasive disc, of which
a background spectra was taken before. Spectra were taken over a
wave number range from 4000 to 250cm⁻¹, with a spectra resolu-
tion of 4cm⁻¹. The results have been converted to absorbance
units using the Kubelka-Munk algorithm.

Results: Fig.1 compares the results for a chondrule, a com-
 pact type A CAI (mainly Gehlenite and Grossular) - and matrix
material from Allende with a Fo₅₀ standard olivine. The chon-
drule spectrum is virtually indistinguishable from olivine analy-
 ses, Similar, the matrix analysis reflects the dominance of olivine.
The spectra of the CAI fragment differs clearly and shows three
characteristic bands at 1011cm⁻¹, 969cm⁻¹ and 912cm⁻¹

Fig.1: FTIR spectra of components in Allende, compared
with a Fo₅₀ standard