


Experiment Report Form

 ESRF	Experiment title: Non-destructive elemental and structural characterization of unique stellar condensate materials on the sub-micron scale	Experiment number: ES-107
Beamline: ID16B-NA	Date of experiment: from: 23/04/2014 to: 29/04/2014	Date of report: 9/9/2015
Shifts: 21	Local contact(s): Remi Tucoulou tachoueres	<i>Received at ESRF:</i>
Names and affiliations of applicants (* indicates experimentalists): Prof. Dr. Frank e. Brenker (GeoScience Institute, JWG University, Frankfurt am Main, Germany) Brecht Laforce* (X-ray Microspectroscopy and Imaging Group, Ghent University, Ghent, Belgium) Jennifer Rudloff* (GeoScience Institute, JWG University, Frankfurt am Main, , Germany) Dr. Sylvia Schmitz* (GeoScience Institute, JWG University, Frankfurt am Main, , Germany) Dr Bart Vekemans* (X-ray Microspectroscopy and Imaging Group, Ghent University, Ghent, Belgium) Prof. Laszlo Vincze (X-ray Microspectroscopy and Imaging Group, Ghent University, Ghent, Belgium)		

Report:

The results of this Experiment have been published. Full reference details:

Laforce, B.; Schmitz, S.; Vekemans, B.; Rudloff, J.; Garrevoet, J.; Tucoulou, R.; Brenker, F. E.; Martinez-Criado, G.; Vincze, L. *Anal Chem* **2014**, *86*, 12369-12374.

ABSTRACT: The new ESRF ID16B-NA Nanoanalysis beamline has been applied for the first time for XRF imaging with a resolution level down to a few tens of nanometers on rare geological materials: meteoritic fragments from achondrite NWA 6693 and diamond inclusions. The instrument proved to be an extremely valuable tool for mapping samples containing submicrometer heterogeneities. It was discovered that the track of bubblelike inclusions in NWA 6693 consists mainly of Cr-rich phases. Some inclusions containing Ni and Ca were also detected. In diamond SL05, originating from the Juina region in Brazil, multiple inclusions were analyzed with dimensions smaller than 1 μm . Raman spectrometry measurements indicated the presence of a ringwoodite inclusion in this diamond; the detection of several iron-rich inclusions justifies further investigation of this material.