refinement, or to obtain diffraction data from submicron crystal
grain with high signal to noise ratio.

The microbeam has been applied to olivine ((Mg,Fe)₂SiO₄) and two unknown crystals included in a thin section of ureilite
(meteorite) with thickness of 30 μm, in order to (1) obtain site
occupancies of Mg and Fe in cation sites (M1 and M2) which
indicate thermal history of the sample, (2) identify two unknown
material. The results are summarized below.

(1) Structure refinement was successfully carried out in an
usual manner based on more than 300 Laue intensities, and site
occupancy of Mg in M1 site was determined as 0.908(4) under the
constraint of Mg and Fe abundant which was analyzed by EPMA.

(2) One of the unknown crystal is determined as diamond, and
the thermal parameter (B) was refined to be 0.18(3)Å² by the
least-squares method based on 12 Laue diffraction intensities.
The other was revealed to be a face-centered cubic phase of iron (Fe)
which was crystallized, topotaxial to the olivine, of Fe atoms from
M1 and M2 sites under reduction by carbon. The thermal parameter
(B) was also refined to be 0.06(1)Å² based on 8 Laue diffraction
intensities.


MS01.05.06 STRUCTURAL INVESTIGATIONS ON MI-
CRYSTALS WITH A HIGHLY COLLIMATED SYN-
CHROTRON BEAM. A.Bram, S. Fiedler, C. Riekel, European
Synchrotron Radiation Facility, BP 220, 38043 Grenoble, France

A endstation for single crystal microcrystallography has been
installed at the ESRF microfocus beamline [1]. A monochromat-
ic beam from an undulator is demagnified by an ellipsoidal mir-
ror. Background reduction is effected by a post collimator. A
liquid N₂ cooled CCD detector with converter screen and optical
demagnification is used for data collection on a K-goniometer. In
order to minimize the influence of air scattering the whole goni-
ometer can be placed in a vacuum vessel. First experiments have
been performed on inorganic crystals, proteins and small organic
fibres. The present setup will be shown together with the results
of selected experiments.

1348 - 1350 (1995)

MS01.05.07 MICRODIFFRACTION ON Be SINGLE CRYS-
TALS WITH SYNCHROTRON RADIATION. S. Fiedler, A.
Bram, C. Riekel1 and M. Burghammer2, European Synchrotron
Radiation Facility, BP 220, 38043 Grenoble Cedex, France. 1:Institut
f. Kristallographie, Theresienstr. 41, 80333 Muenchen, Germany.

The microdiffraclometer installed on the Microfocus beamline
at the European Synchrotron Radiation Facility has been used to
study single crystals of Be as a function of crystal volume in order
to derive accurate structure factors. Crystals of conical shape have
been produced by chemical etching techniques. The smallest tips
obtained had diameters between 1-2 micrometres. Crystal volumes
down to a few cubic micrometers have been examined by mono-
chromatic radiation (λ=0.0687 nm) which corresponds to a mini-
mum scattering power of 8e8*10^11 (defined as in [1]). Datasets
with a resolution down to 0.04nm have been collected with an
online area detector. Background scattering had to be reduced as
far as possible by using microcollimators in combination with a
focussed beam. Results of the refinement of the extinction and the
temperature factor will be reported.


MS01.05.08 DIFFRACTION ANOMALOUS FINE STRUCT-
URE AT THE ESRF BY USING DISPERSIVE & MONO-
CHROMATIC DIFFRACTION. J. L. Hodenc1,2, J. Vactinova1,
H. Renevier1, P. Wolters1, J. F. Berar1, M. Hagelstein2, A. San
Miguel1, Lab. Cristallographie CNRS, BP 166, F-38042 Grenoble,
France, 2ESRF, BP 220, F-38043 Grenoble, France

We present several Diffraction Anomalous Fine Structure
(DAFS) studies performed at ESRF and at LURE on platinum or
iron oxydes and on multilayers, using two different experimental
modes: the Dispersive Diffraction mode (DD) which uses the
combination of X-ray energy dispersive optics, sample goniome-
ter and a two dimensional position sensitive detector and the Multi
Monochromatic Diffraction mode (MMD) performed with clas-
sical monochromatic optics. We discuss our last results obtained
at ESRF by using these two experimental modes for DAFS data
collection. The DD technique would be precious for time depen-
dent investigations and in-situ experiments and it could be used
not only for DAFS experiments but also for other anomalous scat-
ering experiments.

The DAFS spectroscopy provides in the same experiment
information regarding the local atomic environment through X-
ray absorption processes and long-range order information through
diffraction processes. It can provide site selective and chemical
selective structural information. Up to now, most results obtained
with this method concern materials where structural information
can be extracted from pure, site-selective Bragg reflections. Our
studies apply the technique to highly absorbing "real" materials
and to multilayers containing several anomalous atoms which do
not respect the latter restriction. An accurate empirical absorption
correction procedure for small highly absorbing single crystals
necessary for the DAFS analysis of this kind of samples is devel-
oped. We present a simultaneous multi-wavelength refinement
procedure of several Bragg reflections with the anomalous terms \(\Gamma\) of different crystallographic sites as unknowns.

MS01.05.09 HELICITY SWITCHABLE HIGH ENERGY
X-RAY PHASE RETARDER. J. C. Lang, G. Srajer, S. Shastri,
D. Haeffner, D. Mills, Advanced Photon Source, Argonne Nation-
al Laboratory, Argonne, IL 60439

We have developed a high-energy (E > 50 keV) phase retard-
er capable of producing both left- and right-handed circularly po-
arized photons simultaneously. This phase retarder was constructed
from a single Ge crystal in a monolithic Bragg-Laue design, simi-
lar to that studied previously (D. M. Mills, Nucl. Instr. and Meth.
A266, 531 (1988)). This previous phase retarder while able to pro-
duce photons with a relatively high degree of circular polarization
(P>90%), had a major drawback in it's inability to conveniently
reverse the photon helicity. The phase retarder in this study over-
comes this limitation by simultaneously exciting the (220) and (2-
20) crystallographically equivalent and perpendicular reflections.
Each of these reflections induces an equal and opposite phase re-
tardation between the two beams. A major advantage of this technique is
that it retains the non dispersive geometry between the prelimi-
nary monochromator (Bragg portion) and the Laue phase retard-
ing crystal therefore preserving the maximum possible through-
put of the optic. Details of the construction and characterization of
this optic will be presented.