EUROPEAN **S**YNCHROTRON **R**ADIATION **F**ACILITY
INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

ESRF

Experiment Report Form

ESRF	**Experiment title:** XAS to relate Er site with Er 1.5 um photoluminescence, independently from matrix effects.	**Experiment number**: 08-01-880
Beamline:	**Date of experiment**: from: 19-4-2007 to: 25-4-2007	**Date of report**:
Shifts:	**Local contact(s)**: C. Maurizio	*Received at ESRF:*

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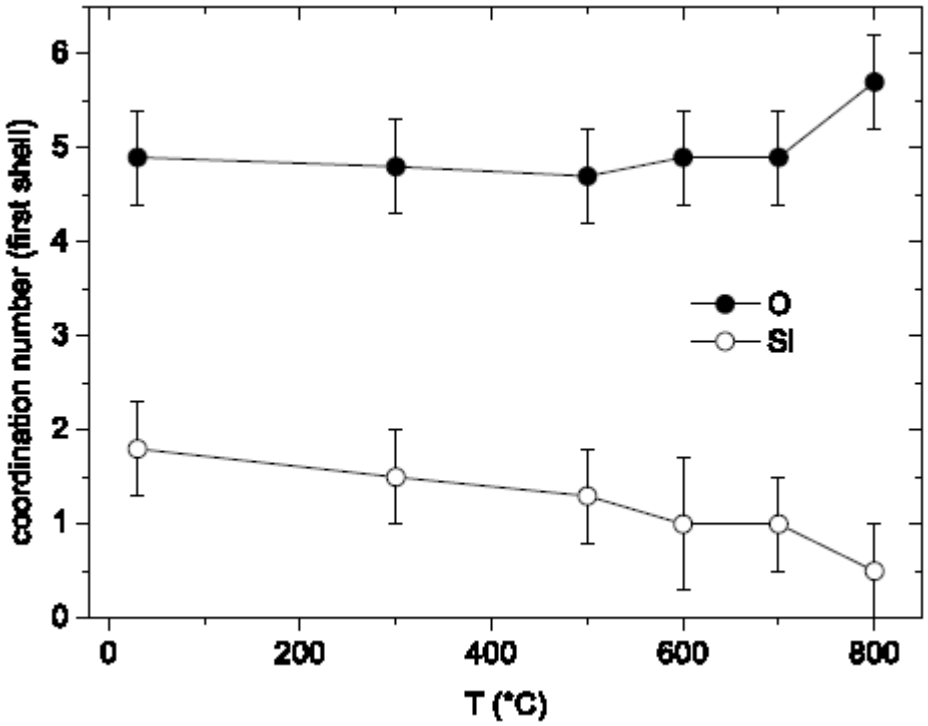
Report:

To prepare the samples, silica slabs (Herasil 1 by Heraeus) have been sequentially implanted with Er ions at three different energies with a total fluence of 6.6×10^{14} Er^{+}/cm^{2}, as measured by Rutherford Backscattering Spectrometry (RBS) using a 2 MeV $^{4}He^{+}$ beam. In this way, an almost flat, 70 nm thick, Er profile has been obtained with an Er concentration of about 10^{20} Er/cm^{3}. The Er-implanted slab annealed at 800 ℃ has been subsequently implanted with Xe ions following the same triple energy scheme to match the Er profile, and at fluence of 7.8×10^{15} Xe^{+}/cm^{2} as measured by RBS.

The EXAFS experiment was performed at Er L3-edge at room temperature in fluorescence mode and in grazing incidence geometry to enhance the Er fluorescence signal. The EXAFS analysis was based on the FEFF8-FEFFIT package.

The first shell of atoms surrounding Er is formed by O atoms and likely Si atoms: this second correlation vanishes at high annealing temperature. Preliminary results indicate for the coordination number of the Er-O and Er-Si shell the trend shown in Figure. Further analysis is in progress.


coordination number (first shell)
T (°C)
O
Si
0
1
2
3
4
5
6
0
200
400
600
800