

These problems can be overcome with the use of the Nd and Ce K edges because at these energies there are no problems of overlapping absorption edges and fluorescence lines; a high photon flux at these energies can be obtained at the GILDA beamline at ESRF, which also has a state-of-the-art fluorescence detector and electronics.

The measurements have been successfully performed in June 2000. We have collected spectra of Nd_2O_3 and CeO_2 standard compounds and of three natural garnets. The raw data for samples and standard compounds are shown in Figs 1 and 2.

A qualitative inspection of the the data indicates that:

- a) the local structural environment of Nd is the same in the three natural garnets differing by the Nd concentration (from 300 to 1100 ppm) and it is different from that found in Nd_2O_3 ;
- b) the local structural environment of Ce is different from that found in CeO_2 .

These results suggest that the REE enters a structural garnet site and not a matrix defect. Moreover there seems to be no dependence of the local structure on the REE concentration.

Quantitative data analysis is in progress. The extended spectra is being analysed with the FEFF package while the near-edge data is treated by means of full multiple scattering theory in collaboration with Dr. Chaboy (University of Zaragoza, Spain) following the procedure outlined by Chaboy and Quartieri (1995) and Quartieri *et. al.* (1999b).

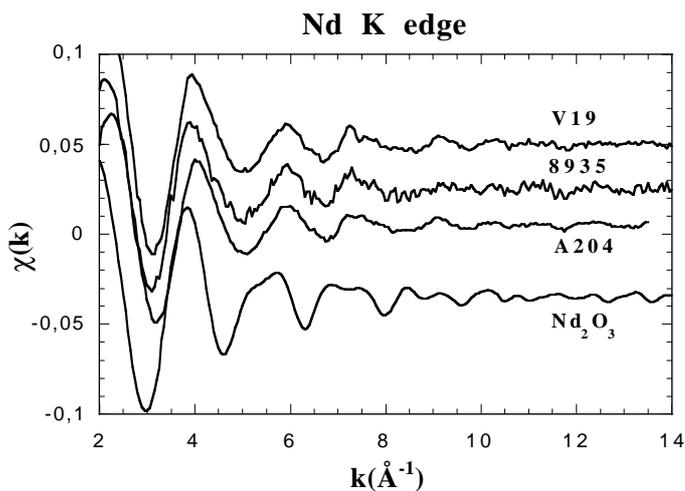


Fig. 1: Nd raw data

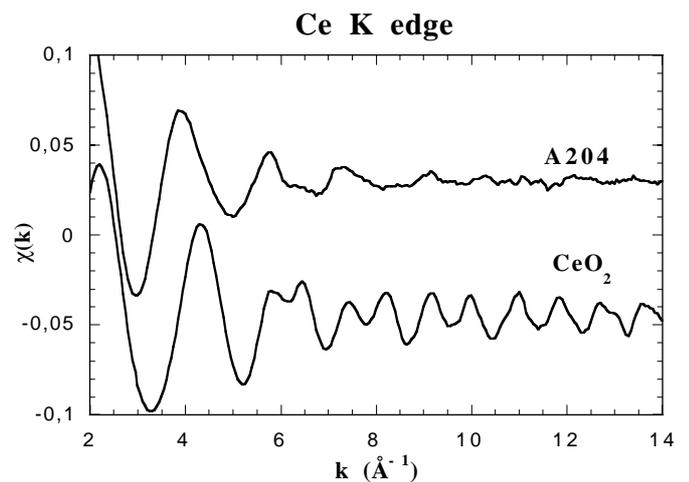


Fig. 2: Ce raw data

References

- Chaboy J. and Quartieri S. (1995) Phys. Rev. B 49, 6349 – 6357.
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 Quartieri S., Chaboy J., Antonioli G., Geiger C.A. (1999b) Phys. Chem. Min. 27