	Experiment title: Fe oxidation state and coordination number in micro-tektite spherules by XANES and high energy resolution XES spectroscopy.	**Experiment number**: EC118
Beamline: ID26	**Date of experiment**: from: 8 november to: 14 november 2006	**Date of report**: 28-Feb-07
Shifts: 18	**Local contact(s)**: Sigrid Eeckhout	*Received at ESRF:*

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Report:

Micro-XANES spectra have been collected at the Fe K-edge for a wide group of natural impact glasses (micro-tektites) belonging to all the three known micro-tektite strewn field. In addition, also a set of micro impact glasses recently discovered during a drilling project at the Bosumtwi crater has been analysed, and the results compared with those of the micro-tektites originated from the same crater.

This is on absolute, the first comprehensive study on a so wide set of micro-tektites and micro-impact glasses.

The experimental set-up has been devised in order to collect both high-resolution XANES and K-alpha detected XAS spectra at the same time. For few samples, also the complete RIXS spectrum has been collected.

A complete set of Fe model compounds spanning all the knowh Fe oxidation states and coordination number (Fe^{2+} in 4-, 5-, 6-, 8-fold coordination and Fe^{3+} in 4-, 5-, 6-fold coordination) has been used in order to extract precise information on Fe oxidation state and coordinationnumber from pre-edge peak analysis.

All the collected spectra display a very good signal to noise ratio, thus allowing a good interpretationof the data.

Both sets of measurement indicate that Fe is essentially divalent in all the micro-tektites studied, irrespective of their composition, formation age, and burial conditions. Average coordination number is intermediate between 4 and 5.

The micro impact glasses coming from the boswmtwi core, despite formed at the same impact as the Ivory-Coast microtektites, display consistently higher Fe oxidation state than

IVC micro-tektites, reinforcing the current view that tektites (and microtektites) are consistently more reduced compared to other impact glasses.
These data also indicate that glassy micro-spherules found in the K/T boundary layer, (regarded as micro-tektites by some author) should definitely regarded as micro impact glasses.