EUROPEAN SYNCHROTRON RADIATION FACILITY
INSTALLATION EUROPEENNE DE RAYONNEMENT SYNCHROTRON

Experiment Report Form

	Experiment title: EXAFS study of Mg-Ti-H and Mg-Ta-H films considered as potential candidates for efficient hydrogen storage.	**Experiment number**: **30-02-1019**
Beamline: BM 30B	**Date of experiment**: from: 20/ 07/11 to: 27/07/11	**Date of report**: 11/09/13
Shifts: 12	**Local contact(s)**: **Jean-louis Hazemann**	*Received at ESRF:*

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Report:

The proposal aimed at the investigation of the local structural arrangement in a new type of magnesium rich hydrides deposited on Si substrates by a plasma assisted co-sputtering technique. Preliminary XRD and SEM experiments had shown that the samples presented a large variety of morphologies and crystallinities depending on the elaboration conditions. A complete identification of phases was not achieved due to both the texturation of the thin film and their low cristallinity. The investigation of the local structural arrangement of these thin films was carried out in order to investigate the presence of ternary hydrides, which have been synthesized only under extreme conditions (high pressure, high temperature).

Two types of samples were investigated: Mg-Ti-H and Mg-Ta-H thin films. For each type of sample, 10 different thin films were analyzed in fluorescence mode at room temperature.
The Ti-based samples were analysed under vacuum, using the Ti K edge (energy 4966 eV). Ti, TiO, TiO2, TiH2 and Ti2O3 analysed in transmission were used as references. The Ta L3-edge (energy 9881 eV) was used for the Ta-based samples with the following references: Ta, TaH2, LiTa3O8 and Ta2O5.
A total of 127 scans have been recorded. The data need to be individually corrected due to the difference in efficiency of some of the 30 elements of Canberra fluorescence detector. This work is still under progress.