ESRF	**Experiment title:** Magnetic X-Ray Dichroism on $[Mn_{12}O_{12}(CH_3COO)_{16}(H_2O)_{24}]\bullet 2CH_3COOH\bullet 4H_2O$ (Mn12Ac)	**Experiment number**: HE-556
Beamline: ID12B	**Date of experiment**: from: 24 Feb 1999 to: 26 Feb 1999	**Date of report**: 26 Feb 1999
Shifts: 6	Local contact(s)**:** Nicholas Brookes	*Received at ESRF:*

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Report: A feasibility test of X-ray magnetic circular dichroism measurements have been performed at the Mn-L_{III},L_{II} edges in $[Mn_{12}O_{12}(CH_3COO)_{16}(H_2O)_{24}]\bullet 2CH_3COOH\bullet 4H_2O$. Although we suffered some problems, both related to charging and damaging of the sample in the beam and to the data acquisition software of the beam-line (a computer crash caused the loss of the last shift), the results we have obtained demonstrated the feasibility of the experiment. Although the data analysis is still in a very preliminary phase (the measurements are just finished), the first results we had are very interesting. In particular we had strong indication that i) the partition of the total magnetization between Mn(III) and Mn(IV) is feasible looking at the MCD signal (see Fig. 1), and ii) the angular momentum is quenched in this system and all the magnetization is due to the spin, as the integral of the dichroic signal is vanishing small (see Fig. 2).

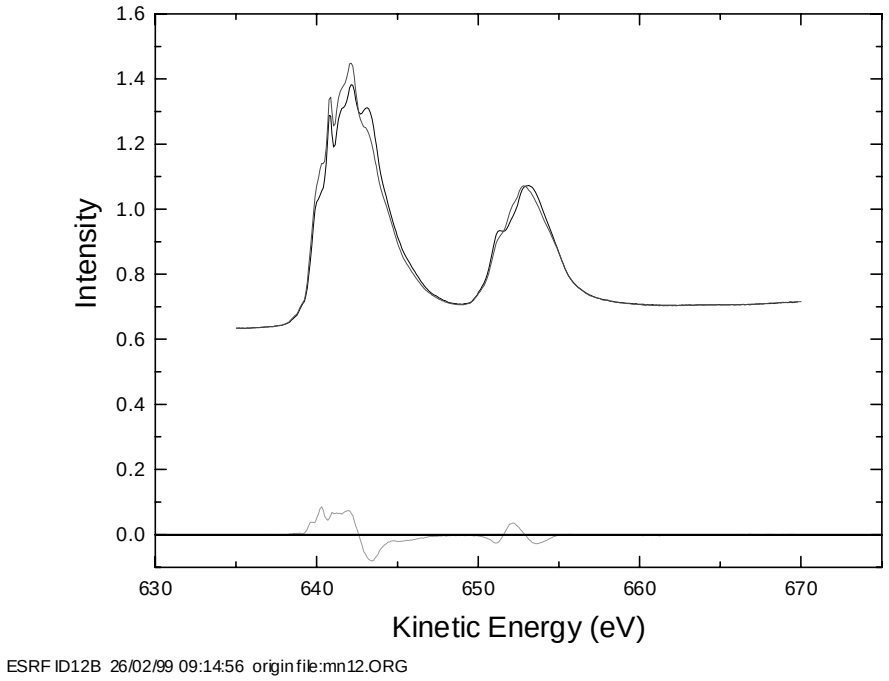

Fig. 1. MCD in $[Mn_{12}O_{12}(CH_3COO)_{16}(H_2O)_{24}]\cdot 2CH_3COOH\cdot 4H_2O$ at 2 K and in a field of 1.5 T. By comparison with standard material, the peak at c.a 640 eV can be attributed to Mn(III), the peak at c.a 633.5 eV to Mn(IV).

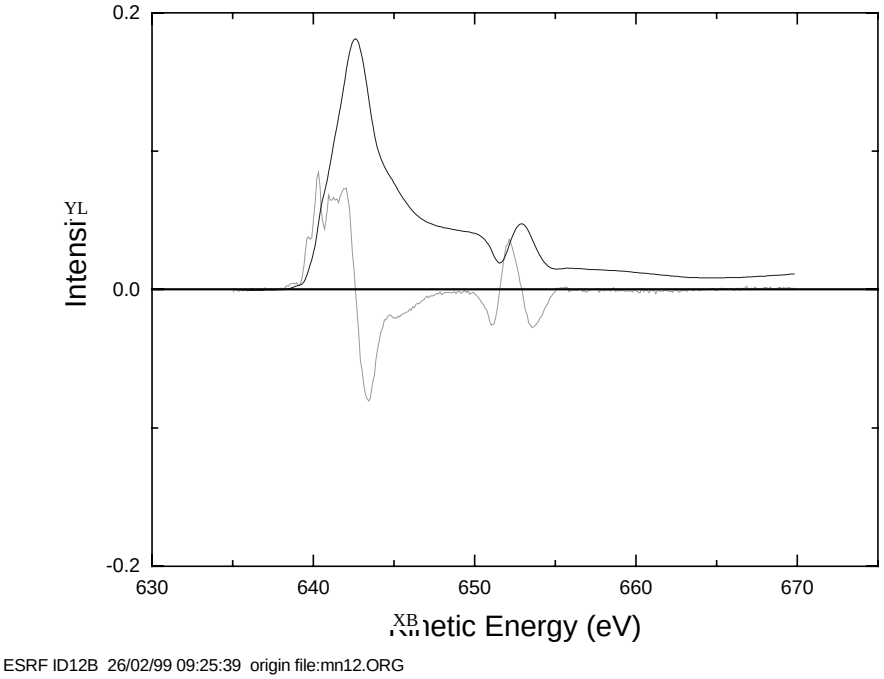

Fig. 2. MCD signal of the previous figure with the corresponding integral curve. As it is apparent, the integral is vanishingly small and this stronlgy support the assumption of quenched angular momentum in $[Mn_{12}O_{12}(CH_3COO)_{16}(H_2O)_{24}]\cdot 2CH_3COOH\cdot 4H_2O$.