# Using MOS-500 for Magnetic Circular Dichroism

## I – Introduction to MCD

The principle of Magnetic Circular dichroism is to run CD measurements (steady state mode) under a controlled magnetic field. MCD is capable of determining both oxidation and spin state. Main applications are in biology and biochemistry, for example metalloproteins and ferric heme proteins are the most likely candidates for MCD measurements, as the presence of metals with degenerate energy levels leads to strong MCD signals. In this note we illustrate capabilities of MCD accessory using horse heart cytochrome c.
However proteins can also show some MCD signal without metal centers, MCD being capable of stoichiometrically measuring the tryptophan content of proteins assuming there are no other competing absorbers in the spectroscopic system.

## II– MCD using MOS-500

MCD accessory consists of a compact 1.4T magnet (fig.1) that can be easily fitted into MOS-500 sample compartment. The magnetic shield of the standard MOS-500's photomultiplier is strong enough so high voltage is not affected by magnetic field. Contribution of natural CD is removed by a quick inversion of magnetic field polarity.

**Fig. 1 : MCD accessory**

MCD is an application highlighting benefits of MOS-500 technology. Indeed MCD signals are always recorded above 195 nm, so there is no need to purge optics with N2 and user benefit from incredible wavelength resolution of grating monochromators in visible region.

## III–Experimental conditions:

1 mg/ml horse heart cytochrome in 1 mm cuvette is used to demonstrate capabilities of MCD accessory. Spectrum was collected in Soret region from 350 nm to 450 nm by collecting data point every 0.1s using 1 nm slits.

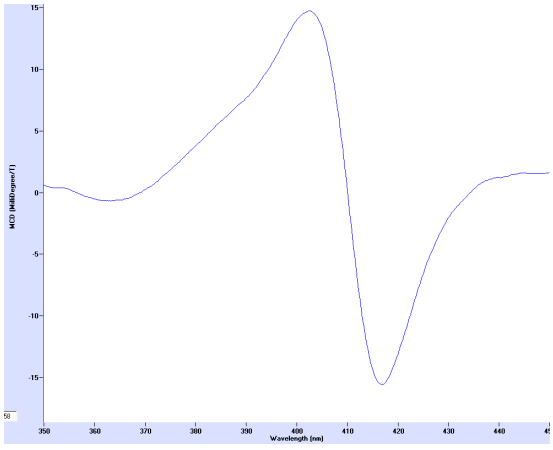


**Fig. 2 : cytochrome c MCD spectrum**