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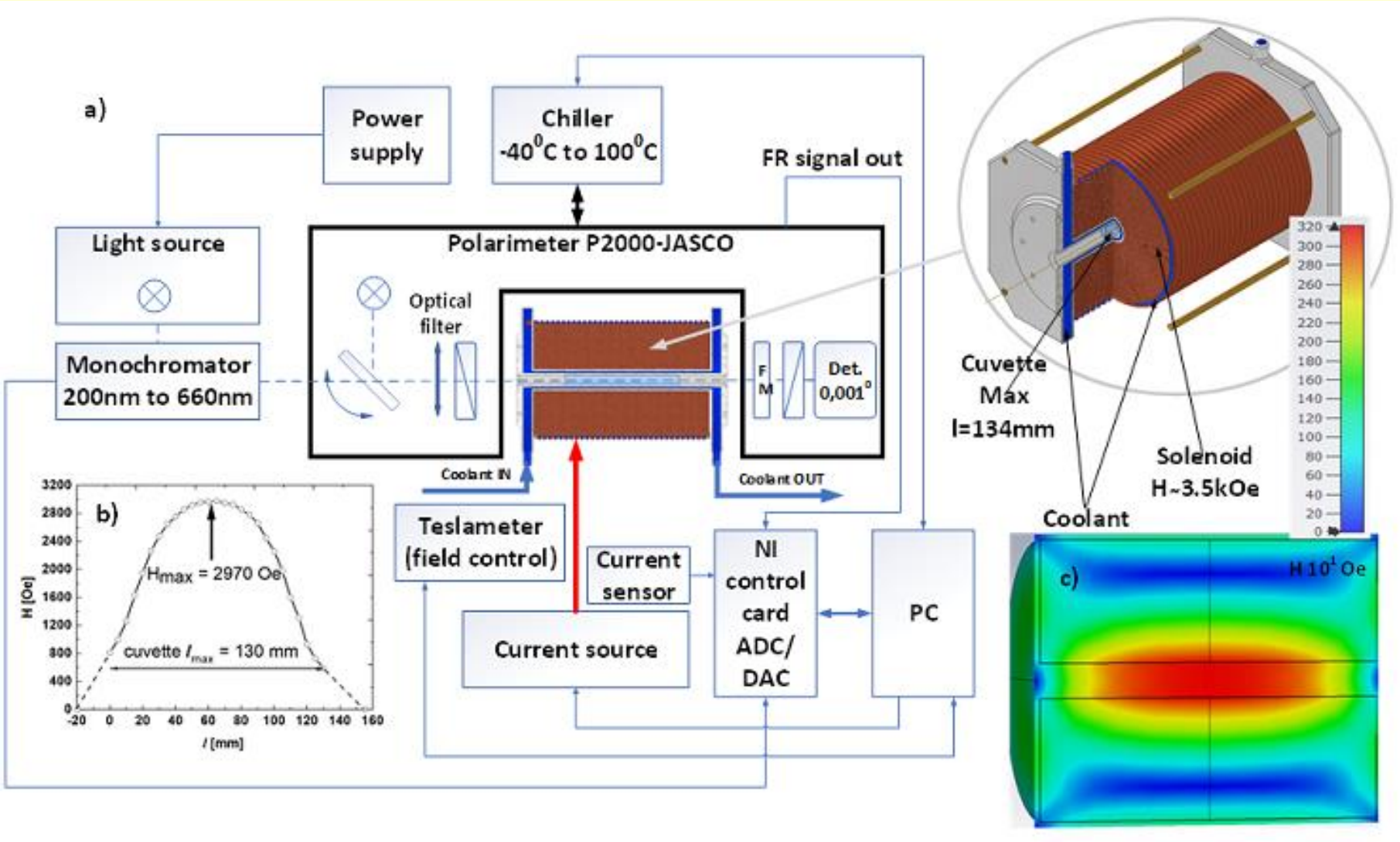
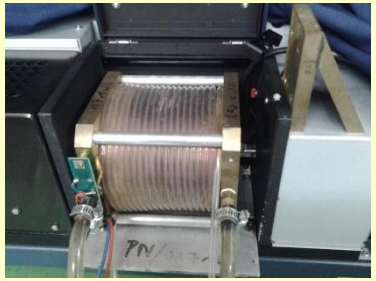
Magnetooptical Investigation

Marceli Koralewski

Faculty of Physics, Magnetooptics Laboratory, e-mail koral@amu.edu.pl

Experimental set –up for MORD measurements



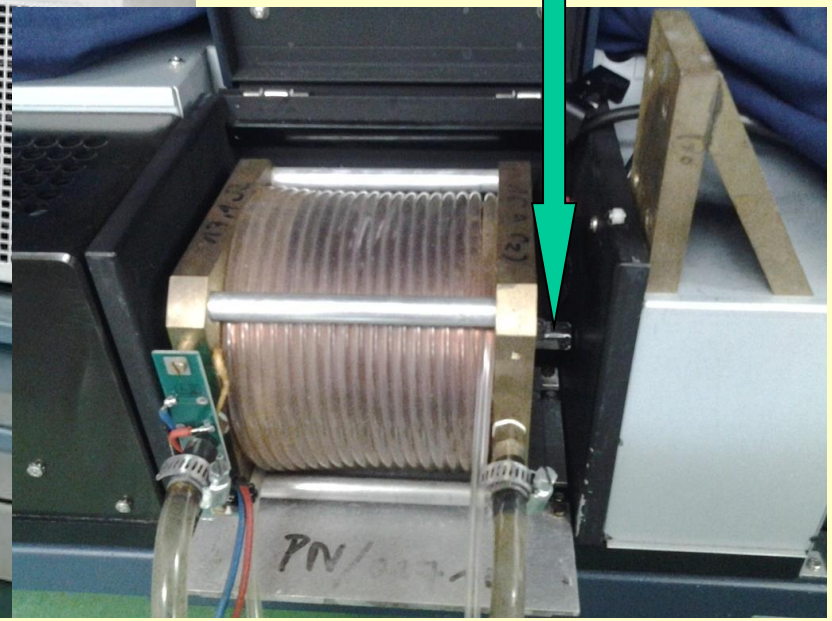


H = 0 ÷ 3.5 kOe
T = 5 ÷ 90 °C
250 ÷ 650 nm

M. Koralewski, M. Baranowski, A. Ryzner J. Mol. Liq. **339**, 117279 (2021)

Experimental set-up
for MORD measurements

Cuvette is placed
inside the solenoid



Experimental set-up for Faraday rotation – low temperature (8-350 K)

$H = 0 \div 12$ kOe

$T = 8 \div 350$ K

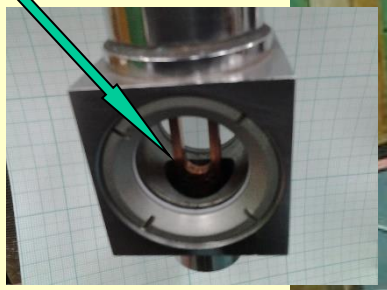
$\lambda = 632.8$ nm

532 nm,

$514 \div 458$ nm

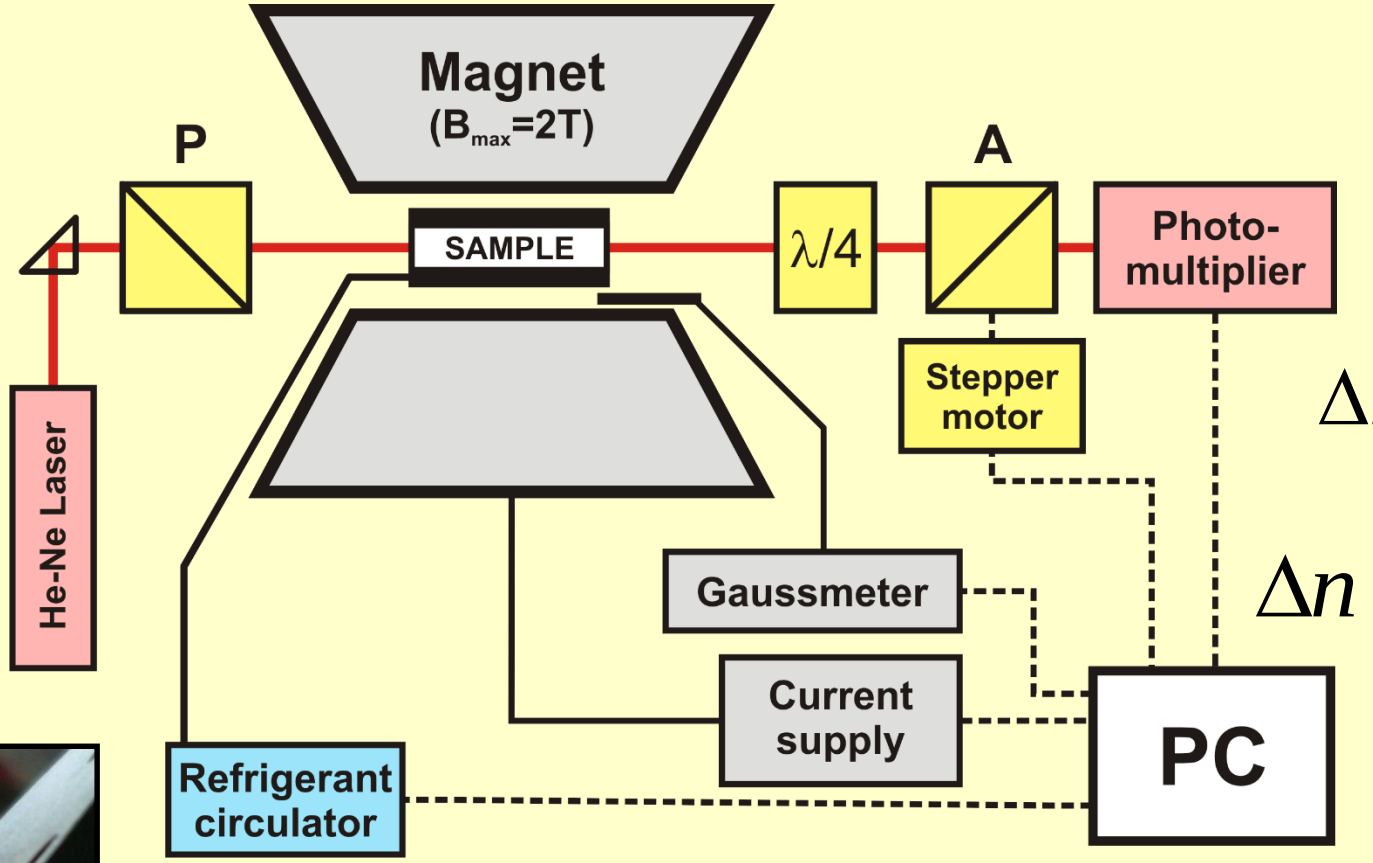
$\Delta\Phi = 0.001$ °

Cold finger where sample will be mount



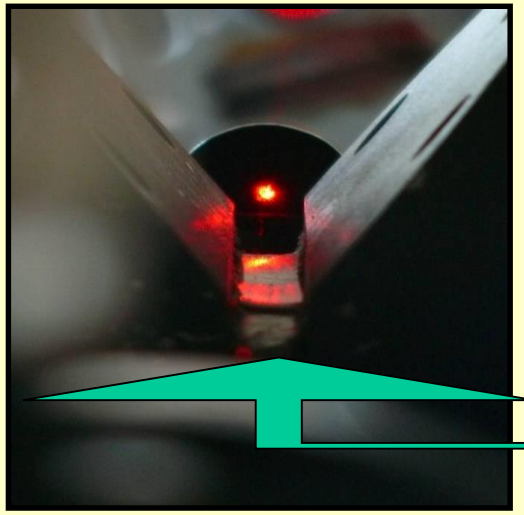
Magnetic linear birefringence set-up

H = 0 ÷ 20 kOe
T = 5 ÷ 90 °C
λ = 632,8 nm
ΔΘ = 0,001 °

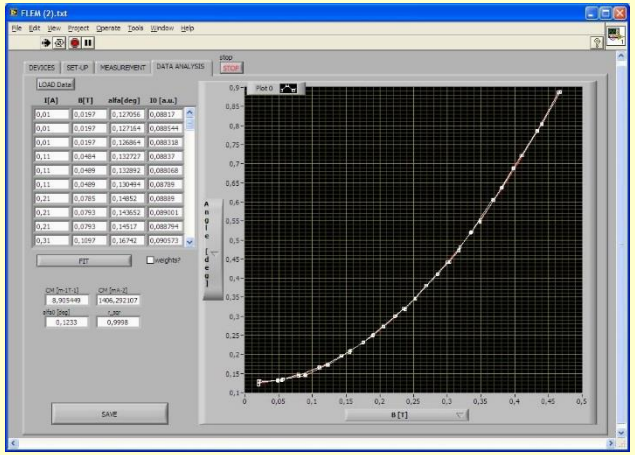


$$\Delta n = \frac{\lambda}{\pi L}\theta$$

$$\Delta n = \lambda C^{CM} H^2$$

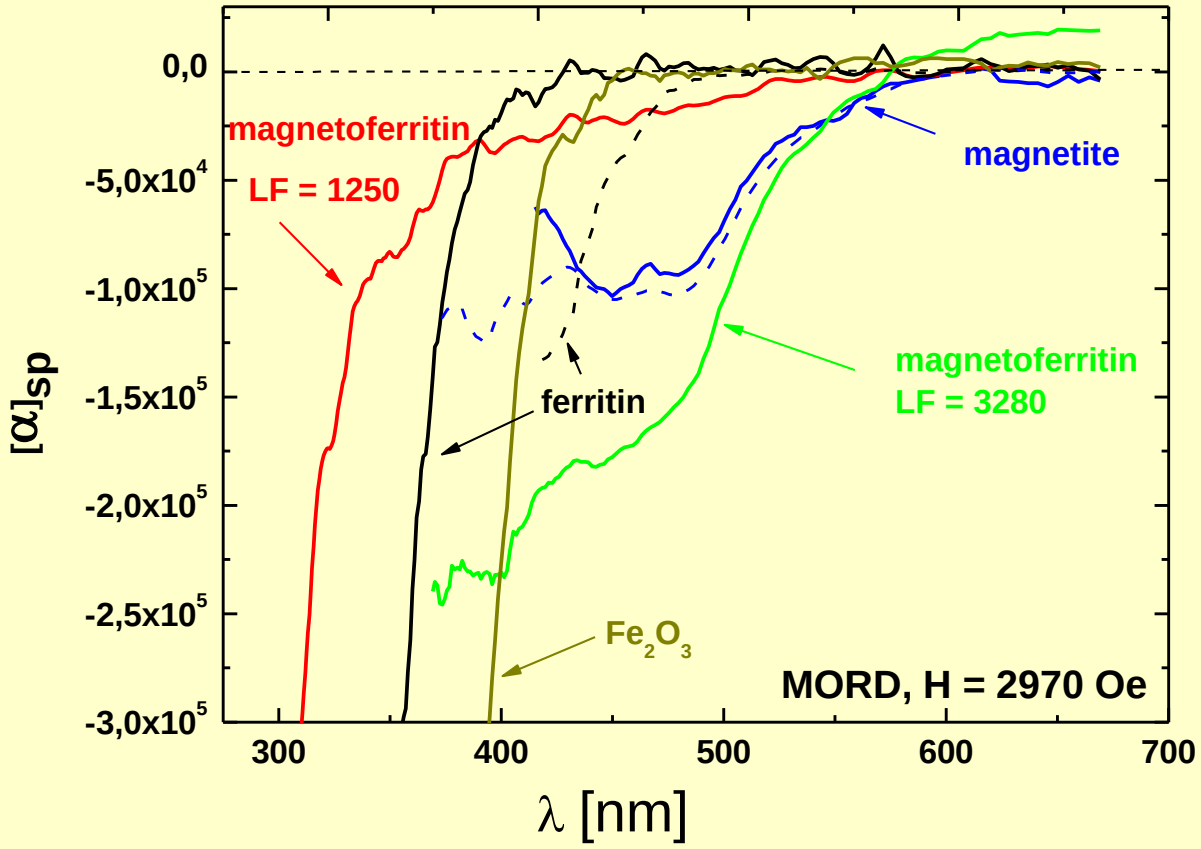


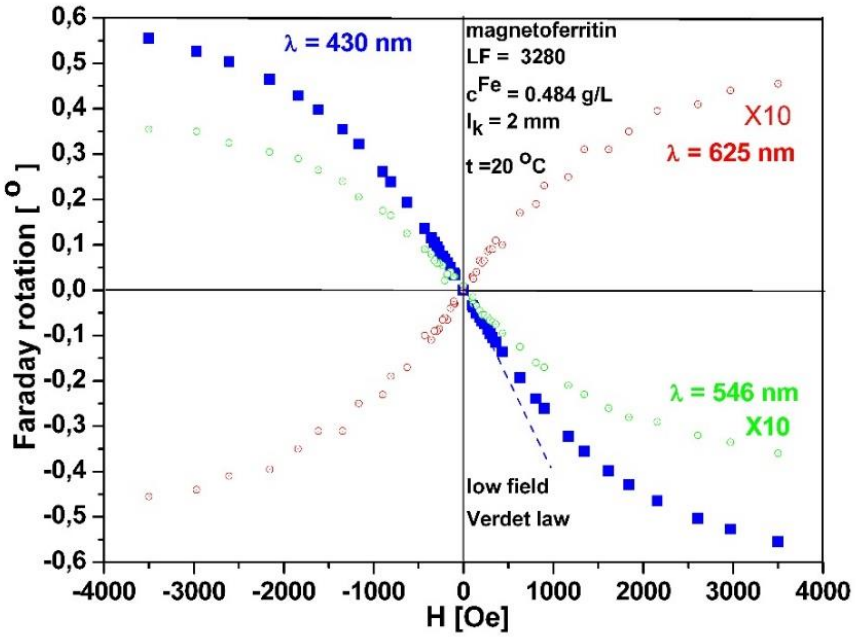
Here we can use commercial as well as lab made cuvette

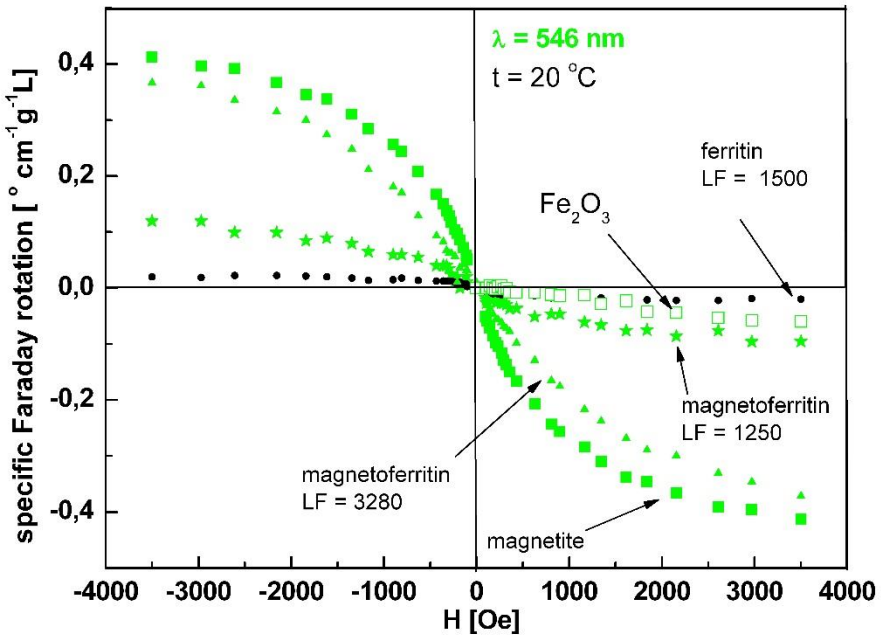


M. Koralewski, M. Pochylski, J. Gierszewski, JMMM, **323**, 1140 (2011)

Magnetooptical studies of magnetic NPs



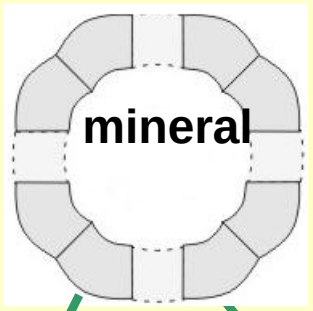




M. Koralewski et al. Nanotechnology, **23**, 355704 (2012)

Application of Magnetooptic methods

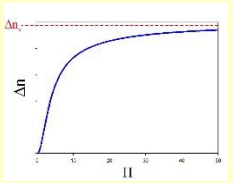
Magnetoopic method

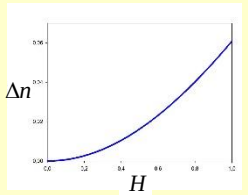


Measured: C^{CM}, $V(\lambda)$

Calculated: $\langle D \rangle$, $\langle \mu \rangle$, $\Delta\alpha$, $\Delta\chi$

Magnetic birefringence

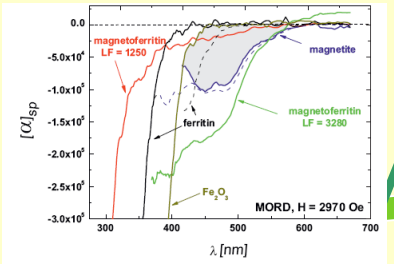


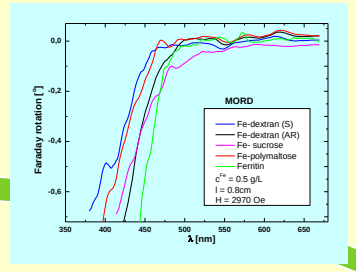


Magnetically strong

Magnetically weak

MORD





Fe_3O_4

γ-Fe_2O_3

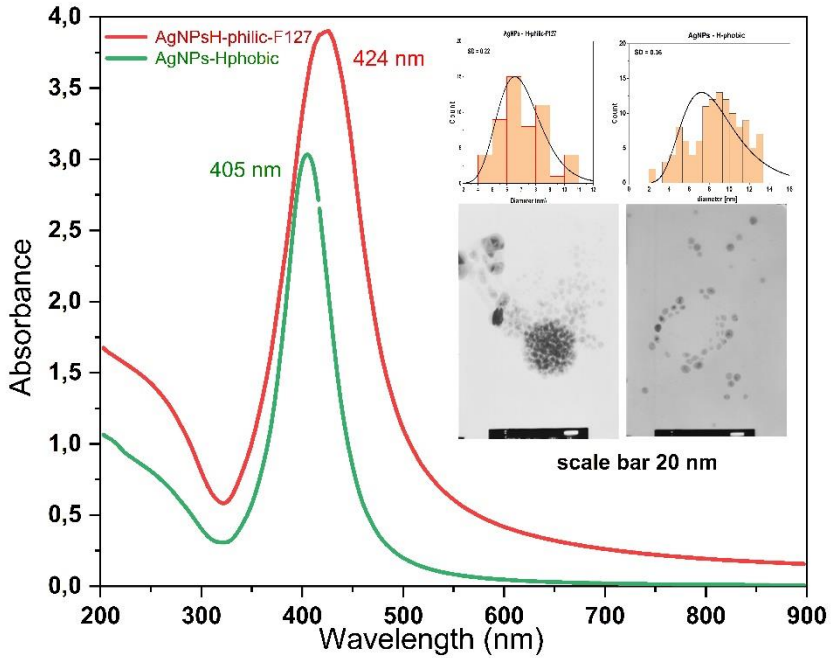
β – FeOOH

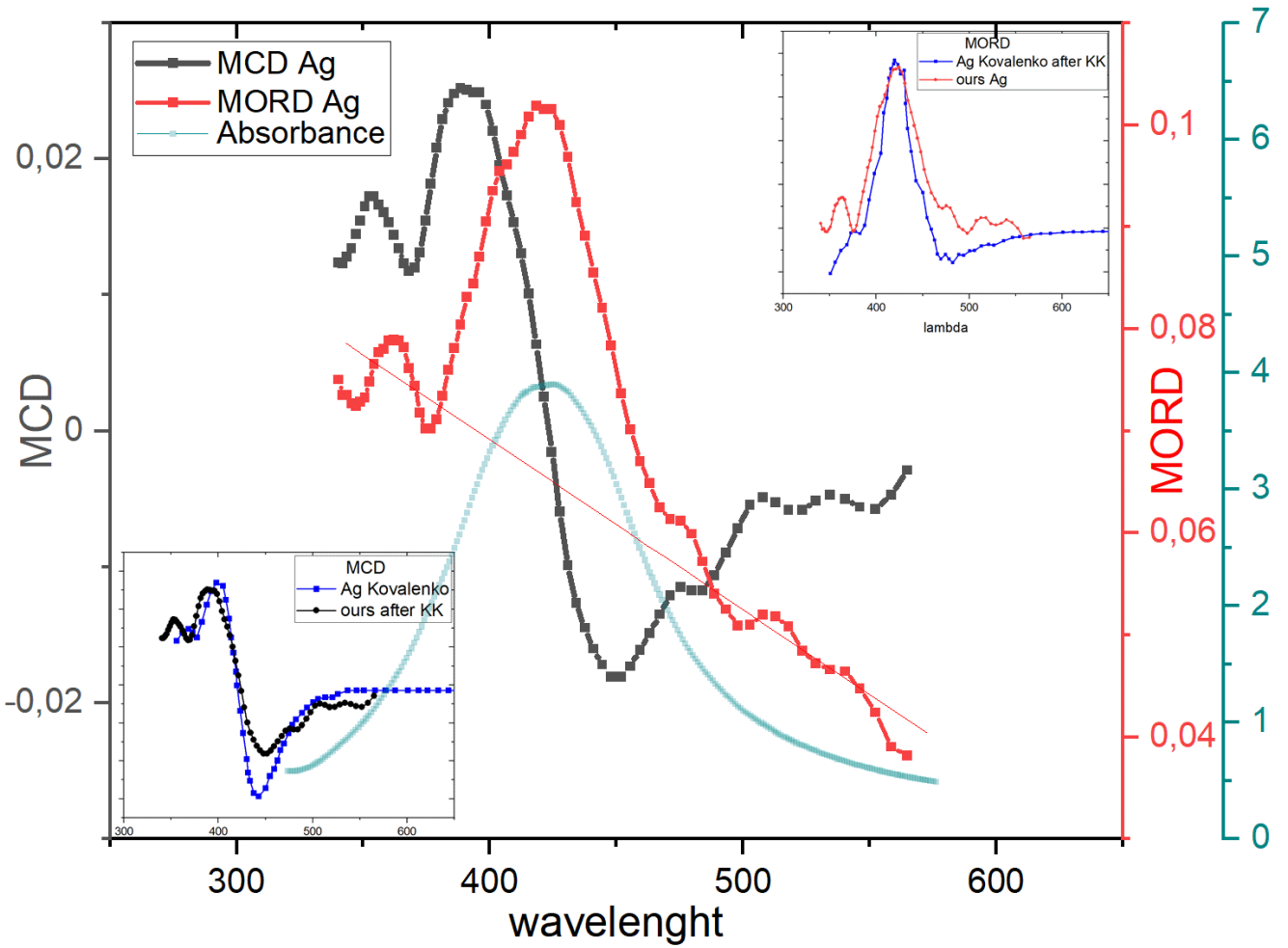
Fe mineral discrimination

Application → **biomedicine?**

O. Gorobets, S. Gorobets, M. Koralewski, Int. J. Nanomed., **12**, 4371 (2017)

Magnetooptical studies of AgNPs





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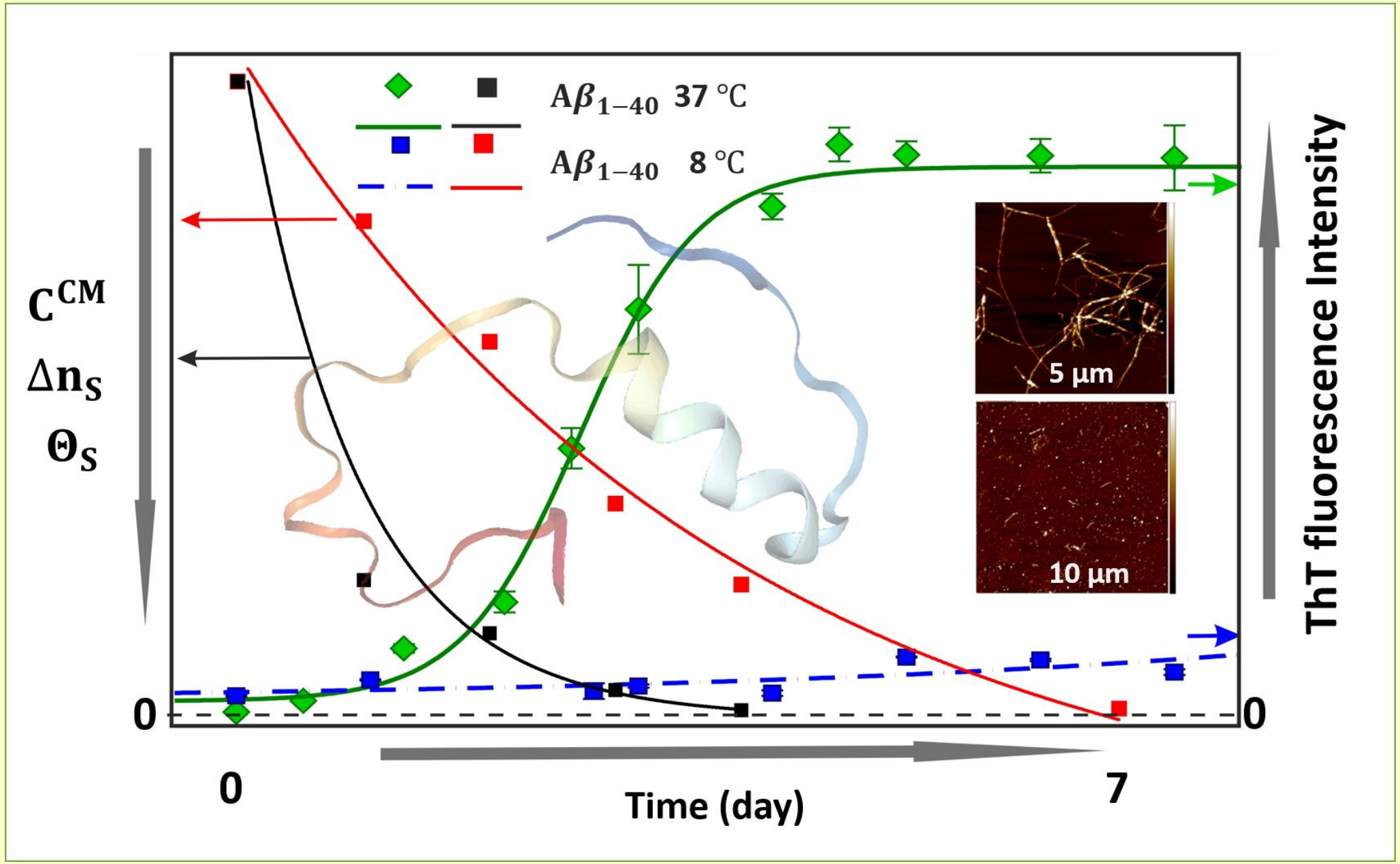
Magnetooptical studies of Amyloid peptide



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