UV-vis-NIR spectroscopy in diffuse reflection in the coordination chemistry of d- and f-metals

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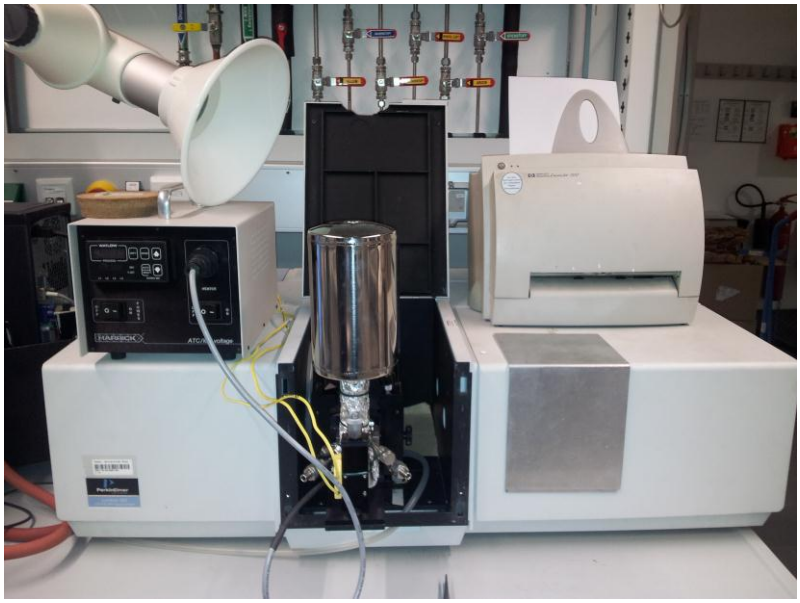

We work with a Perkin-Elmer Lambda 900 UV-VIS-NIR spectrometer with the „Praying Mantis“ ™ accessory allowing the measurement of powder samples in diffuse reflection technique with the temperature range of 110 K to ambient temperature (see Fig. 1).

This lecture will present a few examples from our recent investigations of the coordination chemistry of d-metals and f-block elements. The challenges for the measurement set-up will be discussed and possible obstacles and the (partial) solution of problems will be presented.

The first part will be dedicated to the variable temperature measurements of Fe(II) spincrossover complexes [1]. These compounds are characterised structurally, magnetically as well as spectroscopically. The colour changes due to the electronic transition between a low- and high spin state thus allowing for a quantitative determination of the spin state ratio at any temperature measured. The second part will deal with our new investigations on lanthanide/actinide coordination chemistry such as uranyl-complexes [2] and recent results on gadolinium compounds [3] (see Fig. 2).

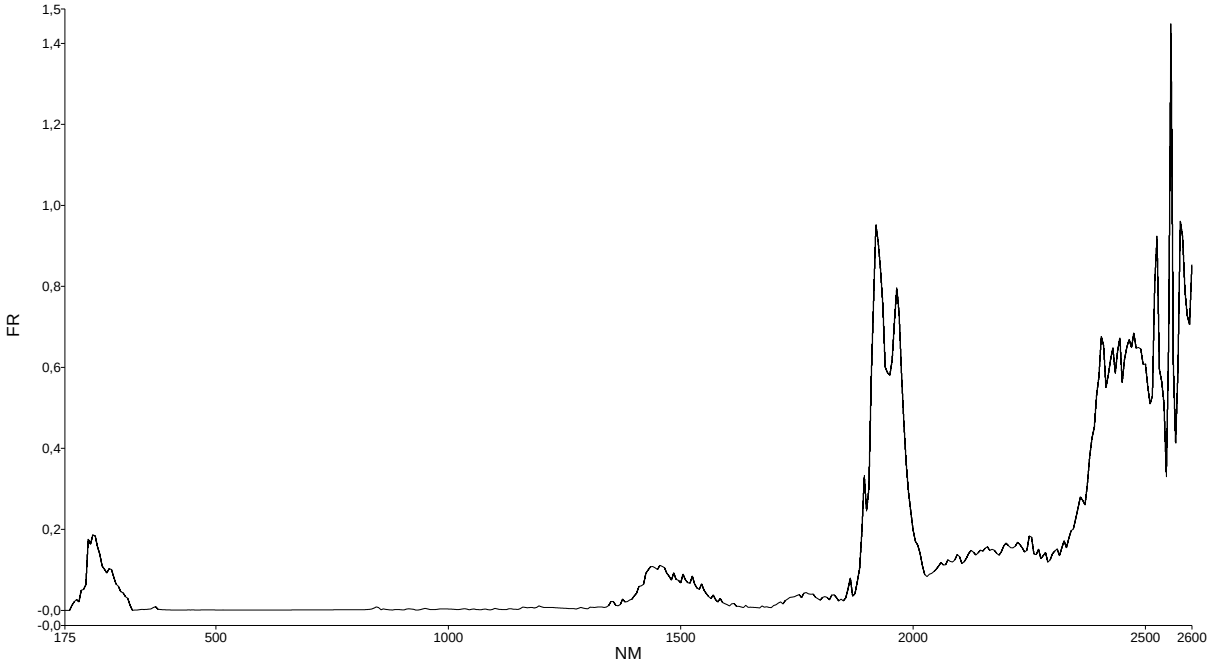

Fig. 2: UV-VIS-NIR spectrum of Gadolinium(III)trifluormethansulfonat

References:

[1] D. Müller, C. Knoll, B. Stöger, W. Artner, M. Reissner and P. Weinberger, *Eur. J. Inorg. Chem.*, **5-6** (2013) 984–991.
[2] G. Steinhauser, G. Giester, C. Wagner, P. Weinberger, B. Zachhuber, G. Ramer, M. Villa, B. Lendl, *Inorg. Chem.*, **51** (2012) 6739 - 6745.
[3] C. Knoll, Bachelor Thesis, Vienna University of Technology, 2012.