

***Vibrational spectroscopic study of the interaction between Streptomyces species and heavy metals***

A. Walter<sup>1</sup>, S. Kuhri<sup>1</sup>, P. Rösch<sup>1</sup>, M. Reinicke<sup>3</sup>, E. Kothe<sup>3</sup>,  
J. Popp<sup>1,2</sup>

<sup>1</sup>Institut für Physikalische Chemie der Friedrich-Schiller-Universität Jena,  
Helmholtzweg 4, 07743 Jena, Germany

<sup>2</sup>Institut für Photonische Hochtechnologien, Albert-Einstein-Str. 9,  
07745 Jena, Germany

<sup>3</sup>Institut für Mikrobiologie der Friedrich-Schiller-Universität Jena,  
Neugasse 25, 07743 Jena, Germany

Microbial life has conquered highly contaminated environments and developed metabolic processes to cope with hostile habitats. The adaption of the microorganisms to those contaminations has a high potential for the development of new remediation strategies. This requires isolation of adapted microbes and the analysis of the complex metabolic processes on molecular basis.<sup>1,2,3</sup> *Streptomyces* species have been isolated from a former uranium mining site exhibiting high resistance against nickel and cadmium.<sup>4</sup>

For spectroscopic study a *Streptomyces ssp.* without distinct resistance characteristic has been chosen to investigate first the influence of age, as well as of nutrients and nickel contamination. With the choice of certain spectroscopic methods and statistics different spectral information are retrieve aiming for differentiation and interpretation of the microbe-metal interaction. These experiments provide a basis for further examinations on field strains.

**Acknowledgement:**

We gratefully acknowledge financial support from the Deutsche Forschungsgemeinschaft (Graduiertenkolleg 1257 “Alteration and element mobility at the microbe-mineral interface”).

**References:**

- [1] E. Kothe, H. Bergmann, G. Buechel, *Chem. Erde* **65**, 7 (2005).
- [2] G. Haferburg, E. Kothe, *J. Basic Microbiol.* **47**, 453 (2007)
- [3] S. Stöckel, S. Meisel, R. Böhme, P. Rösch, J. Popp, *J. Raman Spectrosc.* (2009), DOI 10.1002/jrs.2292
- [4] A. Schmidt, G. Haferburg, G. Sineriz, M. Merten, D. Buechel, E. Kothe, *Chem. Erde* **65**, 131 (2005).