Project name: **Development of novel medical device**

Travel/Event Report

dd.mm.yyyy - dd.mm.yyyy *(Date of the report to be added)*

General information

Name of the rapporteur	**Name of the rapporteur's organisation**
Anna Stenstam	CR Competence AB
Type of research (nanotechnology/health care/chemistry etc.)	**Name of the research facility**
Biotechnology	MAX
Date of the measurement, duration	**Location of the event**
1 day. May 2012	Lund
National Industrial Liaison Officer from rapporteur's country participating in the measurement	
Anders Lassesson, Kajsa Sigfridsson	

Description of the project

Research description (short summary as written in the application)
One of our customers is developing a novel medical device that comprises a metal-binding, amorphous polymer matrix. In this matrix, metal ions are coordinated to amine moieties located on the polymer side-chains. In order to optimise the function of the device, it is critical to determine the average number of bound amine groups per metal ion as a function of critical process parameters. Few methods allow for this type of structural information to be collected from an amorphous system, but the EXAFS setup at MAX-Lab in Lund can actually constitute the tool required. In the study, solutions of an appropriate metal salt in aqueous ammonia provide the structural background information required for a subsequent, detailed structural assessment of the nearest-neighbour environment of metal ions in the polymer matrix. Structural data and complex binding constants for the relevant metal-ammonia complexes can be extracted from the literature. By making the quite reasonable assumption that the coordination geometry of amine by metal ions is retained in the polymer matrix, this background information can then be applied in the refinement of a structural model for metal ion coordination in the polymer matrix
Summary of activities (experiments performed, beam-time used, preliminary overview of results, next steps and other relevant information)
We used EXAFS at beam line i811 on polymers produced by our client in their lab. Two different polymers produced in three different environments were analysed (6 samples in addition to reference systems). The results were very clear a) the material needs to be modified. The coordination number from the tested synthetic routes is not right for the application and it explains current poor performance.

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b) EXAFS is the best and possibly only tool for optimizing the material in this aspect. The client is currently changing the process based on the results.
How would you describe cooperation and assistance from national contact points while preparing and carrying out the research at large scale facilities?
Smooth. The idea to use EXAFS came through discussions with Axel Steuwer (then with ESS). Axel introduced us to Kajsa Sigfridsson and we could talk about the experiment together, by the instrument, already before applying. We applied through science link by the help of Anders Lassesson. The application part was really good as we were trusted about what we wanted and didn't have to put it all into the general context normally of interest for applying for money etc. We got fast approval and time with Kajsa who let Stefan join during the experiment and analysis in order for him to refresh his old EXAFS knowledge. Kajsa gave us the data we needed at this point in a format that was ok for this case. We appreciate the fact that the data we obtained from MAX lab constitutes only a subset of the entire data set, which in this case was perfectly fine. It served our purpose. This is not always the case, often you might want to have more of the operator's opinion on the measurement etc, but as I state here – it was not needed this time and we are aware of this when we go to MAX.
Other personal remarks
Professional.

Annexes

Annexes (list of annexes; meeting minutes, graphical illustrations, tables and other supplementary data)