APPLICATION OF SOLID STATE NMR SPECTROSCOPY IN MINERALOGY AND GEOSCIENCE

Report on the 2007 Short Course of the Deutsche Mineralogische Gesellschaft

The working group on NMR spectroscopy at the Ruhr University Bochum, headed by Dr. Michael Fechtelkord, extended an invitation to researchers to attend the short course “Application of Solid State NMR Spectroscopy in Mineralogy and Geoscience” between May 29 and June 1, 2007. Participants from many areas, from Bochum, Copenhagen, and Innsbruck, took part in the course. For the first time this year, students who successfully participated in a final examination could earn 3 ECTS credit points.

With eleven participants and a PhD student from the NMR working group who supported the participants during the course, the group was complete by the morning of May 29. Even if there were still some tired faces, due in part to long journeys, the morning started with an introduction to the topic of solid state NMR spectroscopy. The course was adjusted to suit each participant because some of the attendees were new to the field while others were already active in solid state NMR spectroscopy. After lunch, and an opportunity for foreign participants to view the Ruhr Valley from the department vantage point, the first measurements of the 1H spin lattice relaxation and dynamics of tetramethylammonium iodide were accomplished. Following detailed evaluation of the data, the group proceeded to a more convenient subject. Regional differences and the meaning of the Eurovision song contest were discussed in a nice pub at the end of the day.

The second day included the study of different interactions, like the magnetic dipolar interaction and chemical shift anisotropy, and how these can be averaged out by the MAS (magic angle spinning) technique. The theory was then practiced using a phlogopite sample. Different experimental spectra were fitted with the WinFit program package.

On the third day, the cross polarization technique and its application to a kaolinite sample were the main topics. Later, the participants enjoyed a bowling evening accompanied by a lively exchange of ideas. The last day was dedicated to the quadrupolar interaction and the application of SATRAS (satellite transition spectroscopy). In the late afternoon the participants left Bochum to travel home. We would like to thank Michael Fechtelkord and his PhD student Ramona Langner for their valuable support during the course, for providing hot coffee, and for answering all questions before and during the course.

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