



Internship

Start-up and application of a THz-Raman spectrometer to investigate crystal modifications

The crystallization group within the Engineering & Technology drives innovative topics in industrial crystallization for the Bayer divisions and supports them in troubleshooting or optimization projects. Furthermore, as the link to current research, new measurement techniques are tested to e.g. characterize crystal systems and to guarantee that the desired crystal modification exists. An emerging method is THz-Raman technique, which allows to distinguish fast between crystal modifications (Polymorphs). Special filters (VHG) extend the reach of Raman into the THz range ($10 \text{ cm}^{-1} - 100 \text{ cm}^{-1}$, figure 1) where important structural details e.g. lattice structures can be discerned.

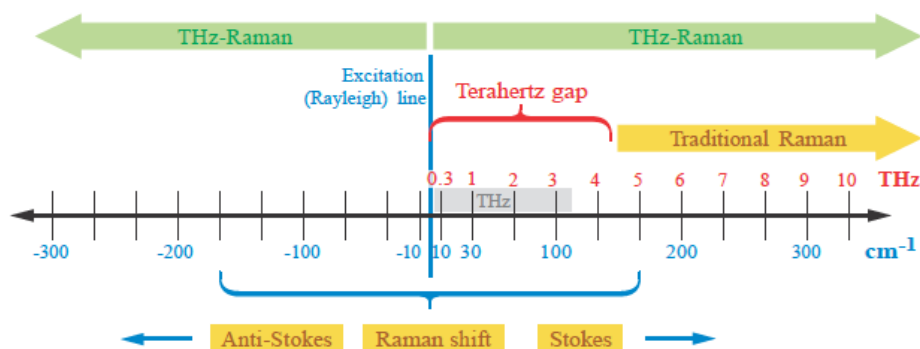


Abbildung 1: THz Raman regime, source: <https://edge.coherent.com/assets/pdf/Accessing-molecular-structure-with-raman-spectroscopy.pdf>

Within this work the new measurement system has to be commissioned, strength and weaknesses of the application have to be pointed out and the system should be evaluated on model crystal systems. Especially, parameters like location of application, solid content and sample preparation need to be investigated and the question has to be answered, to what extent typical measurement methods (e.g. XRPD) must be used. The aim of this work is to propose a how-to for the characterization of A(P)Is and to transfer the knowledge gained to colleagues in the laboratory.

In addition to an interest in chemistry, physics and measurement techniques you should also have a solid scientific background, show a high degree of self-initiative and self-organization as well as general communicative and teamwork skills in an interdisciplinary work environment.

Location: Primarily in Leverkusen

Duration: 6 months

Start: Q1/2020

Contact: Jörn Gebauer (joern.gebauer@bayer.com)