

Development of idealized practices for photoacoustic spectroscopy

MSc Thesis Seminar

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ABSTRACT: Fourier Transform Infrared (FTIR) spectroscopy is an experimental technique used to characterize materials based on molecular vibrations. Infrared light is absorbed by the sample which excites molecular vibrations. Based on the specific vibrations it is possible to determine the composition and information related to structural ordering. Photoacoustic FTIR spectroscopy (FTIR-PAS) combines FTIR with acoustic detection of the infrared absorption. My thesis work focused on investigating FTIR-PAS scan parameters to further develop FTIR-PAS as a quantitative materials characterization method. Based on those results I presented a set of best practices for data collection. I then investigated size related effects on the PAS measurement by applying those best practice parameters to silica spheres. Overall signal intensity increased with decreasing particle size, which has been previously reported. No peak position, shape or relative intensities changes were found. These insights were used to evaluate previously collected calcite data and support previous conclusions that observed effects were related to sample and detection method differences.

ALL ARE WELCOME!