Nanomechanical Infrared Spectroscopy with Vibrating Filters for Pharmaceutical Analysis - DTU Orbit (16/03/2019)

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Standard infrared spectroscopy techniques are well-developed and widely used. However, they typically require milligrams of sample and can involve time-consuming sample preparation. A promising alternative is represented by nanomechanical infrared spectroscopy (NAM-IR) based on the photothermal response of a nanomechanical resonator, which enables the chemical analysis of picograms of analyte directly from a liquid solution in only a few minutes. Herein, we present NAM-IR using perforated membranes (filters). The method was tested with the pharmaceutical compound indomethacin to successfully perform a chemical and morphological analysis on roughly 100 pg of sample. With an absolute estimated sensitivity of 109±15 fg, the presented method is suitable for ultrasensitive vibrational spectroscopy.

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Contributors: Kurek, M., Carnoy, M., Larsen, P. E., Nielsen, L. H., Hansen, O., Rades, T., Schmid, S., Boisen, A.
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