WITec alpha300

Confocal Raman Microscope with AFM

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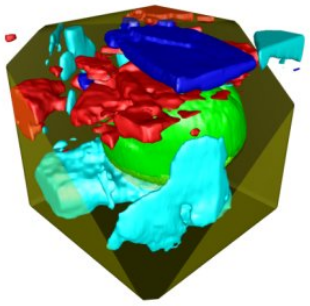
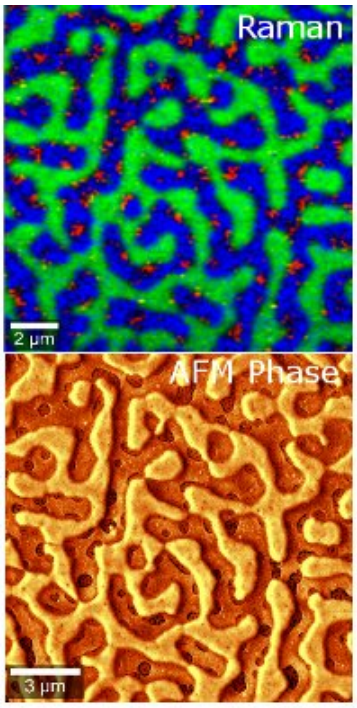
Instrument Description:

The WITec alpha300 Confocal Raman Microscope with an atomic force microscope (AFM) provides the opportunity for 3D chemical and structural mapping of various samples, including living undisturbed biological samples. It is equipped with three excitation lasers at 532, 633 and 785 nm, various optical objectives and three pinhole size options. Using a stepped scan table, the light-diffraction limit for lateral resolution can be surpassed, and specific regions of interest can be revisited. Confocality also prevents noise from positions outside the focal plane, notable fluorescence. Switching between Raman and AFM is done by turning the objective turret. The instrument software can be used for data analysis, including AFM and Raman image overlay, fluorescence background subtraction, cluster analysis and principal component analysis.





Applications:

- Correlative Imaging of biological samples
- Chemical and structural mapping of chemical/biological samples
- Redox state mapping of bioelectrochemical systems
- 3D structural and chemical investigation of biofilms

Requirements for Samples:

The sample has to contain Raman-active components, which can be excited by the available wavelengths. Raman transitions of interest for the different system components should ideally not overlap in all available wavelengths. Air, oil and water objective are available, and the sample should be useable with one of these. The sample must not be easily flammable.

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Picture captions (from top):

- 3D Raman Image of a pollen in crystalline honey
- Combined Raman-AFM measurement of the same sample area of a polymer blend (WITec website)
- Large-area, high-resolution confocal Raman image of a pharmaceutical emulsion (WITec brochure)