

Analysis of bacteria and polymers using Raman spectroscopy

Dr. Leila Zeiri

The Chemistry department and the Nanotechnology Center,

Ben-Gurion University of the Negev, Beer-Sheva, Israel

Raman spectroscopy is used as an analytical tool to identify and characterize chemical and biological systems. It can yield typical “finger print” signature for composition of materials, as well as information related to its crystalline phase and environment. The main drawback of Raman spectroscopy is its weak signals. Enhancement of the spectra can be achieved by adopting resonance conditions via electronic excitation or using nanostructures of coinage metals yielding Surface Enhanced Raman Spectra (SERS).

The presentation will describe detailed SERS studies of bacteria. The effect of the experimental protocol used in the measurement on the resultant spectra will be discussed. It will be argued that this can be used as a tool to enhance the contribution of certain bio-chemicals in various systems. Examples of different SERS active substrates will be shown together with their adaptation to study different systems.

In the second part of the presentation will be devoted to a detailed study of the Raman spectra of polydiacetylenes (PDA). These polymers have numerous applications since they change their structure and color at different environments. It will be demonstrated that their Raman spectra constitute a sensitive tool to follow such effects.