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Combined Laser Induced Breakdown Spectroscopy and Raman Spectroscopy for Pharmaceutical Applications

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I will talk about two complementary spectroscopic techniques, namely Laser Induced Breakdown Spectroscopy (LIBS) and Raman Spectroscopy for the pharmaceutical applications. While Raman spectroscopy which is widely used in the industry to get the molecular information, LIBS is a relatively new technique that gives atomic information. It is an atomic emission based technique involving the interaction of a target with an intense laser pulse which generates plasma. The spectral analysis of the fluorescence emission from the cooling plasma plume contains specific signature of atoms of the material under investigation. The amount of sample and time needed to prepare the sample are far less compared to any other technique used for the elemental analysis such as Absorption, Fluorescence, FT-IR, Raman or Cavity Ring down Spectroscopy. LIBS is particularly attractive for the detection due to its stand-off detection capability, requirement of microscopic quantities of material, and rapid detection. The detection times are very fast which is very ideally suited for the industrial applications. LIBS and Raman studies on pharmaceutical samples have been reported in a recent study. A combined system capable of recording both the Raman and the LIBS spectra can give complementary information.