

In **laser-induced plasma (breakdown) spectroscopy (LIBS/LIPS)** a small portion (a few nanograms) of the sample's surface is vaporized with a temporally short laser pulse. The vaporized matter is turned into a small, bright plasma ball containing atoms, ions and electrons. In the plasma's temperature of over 10,000 degrees Celsius the atoms and ions are excited and emit characteristic light when returning to their ground states. This plasma emission can be spectrally analyzed in great detail which will reveal the original elements present in the plasma. As a method of analysis, LIPS is extremely rapid, with the possibility of as much as 20 recorded measurements per second being executed.

In this laboratory work, in groups of 2-3 people, the basics of LIPS and the mechanisms of plasma formation will be examined. A measurement of different solid materials with the LIPS method will be executed and their basic element content interpreted with the aid of spectral libraries. The time dependence of the plasma temperature is also examined by measuring the samples at different times after the plasma formation.

Times for running these measurements can be arranged with the laboratory assistants.