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# In-situ study of temperature related changes in polymers using LIBS

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The influence of elevated temperatures on the properties of polymers is of great interest for almost all practical applications. Depending on the type of material, polymerisation temperature might influence the final properties of the product. For other polymers, the investigation of high-temperature degradation is of more interest. And for some products, both might be true.

To study temperature related changes in polymers using LIBS (Laser Induced Breakdown Spectroscopy) we have implemented a heating chamber, facilitating temperatures up to 1000°C and different atmospheres, in our commercially available LIBS instrument. Polyimides, which are a type of high-performance polymer, designed to use at temperatures near the expected limits for purely organic materials, were chosen as a sample material. In this work, in-situ measurements during fabrication and for degradation studies were carried out using temperatures up to 400°C. Elemental lines as well as molecular emission bands were used to monitor changes in the polymer structure.

LIBS, polymers