

## Applications of thermal analysis in biomaterials science and biomineralization

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Biomineralization denotes the utilization of inorganic materials by living organisms, with bone, teeth, scales and shells being the most prominent examples. Chemically, such biominerals consist of an inorganic mineral, together with an organic matrix, the latter usually an organic biopolymer like a protein or a polysaccharide. A fine-tuned balance in composition and structure leads to unusual mechanical and optical properties, e.g. with bone and teeth being both hard and elastic.

To elucidate the microstructure of biomineralized tissues, a range of methods has to be applied. Thermal analysis is especially useful to determine the composition of such composites, e.g. to quantify the organic fraction by thermal analysis. This knowledge can be applied in biomaterials science to design new materials with tailored properties.

This approach will be highlighted on a number of examples from bone over crocodile and shark teeth to crustaceans (woodlice).

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