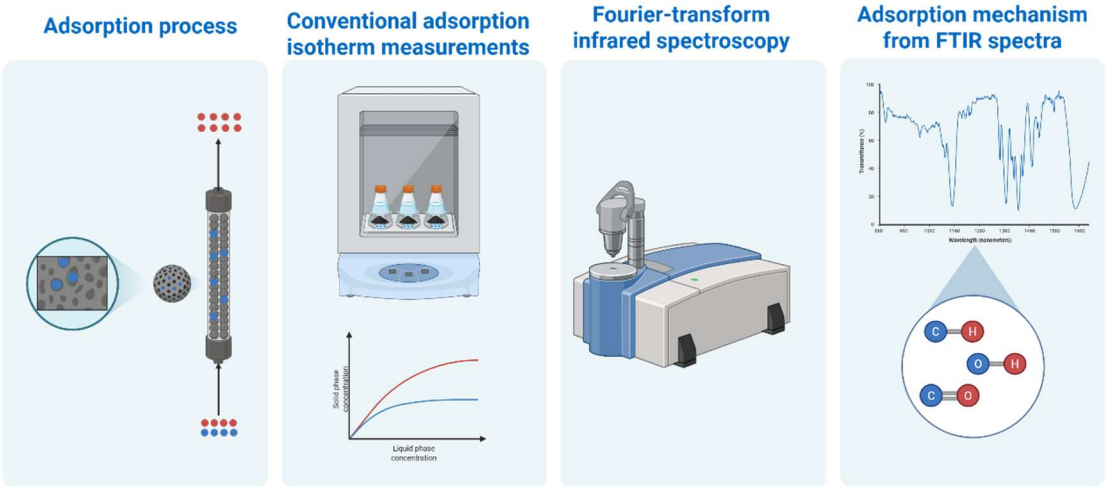
Biothermodynamics
Prof. Dr.-Ing. habil. Mirjana Minceva

Research Internship

FTIR Spectroscopy for Investigation of Adsorption of Bioactive Compounds on Polymeric Adsorbents

Large amounts of valuable bioactive compounds are lost in the waste streams of food and beverage production processes. Recovering these compounds can add value and reduce environmental impact. One promising method to recover them is **adsorption**, where specific molecules are captured on the surface of porous materials (adsorbents).

In this project, you will investigate how bioactive compounds interact with adsorbent materials to better understand the adsorption mechanism. Such knowledge is essential for selecting adsorbents suitable for specific applications. **Fourier-transform infrared (FTIR) spectroscopy**, a method that provides molecular-level insights by detecting changes in vibrational bands of functional groups. This approach helps reveal specific interactions such as hydrogen bonding, which govern the retention of aroma compounds on solid surfaces. FTIR spectra will be measured for single and mixtures of components adsorbed on different polymeric materials. The results of the FTIR analysis will be compared with the affinity and adsorption enthalpy calculated from adsorption isotherm data obtained using conventional methods.



Candidate profile:

- Precise, organized, and able to work independently in the laboratory.
- Basic knowledge of FTIR and adsorption is plus, but not required.
- Familiarity with Origin and/or Python is preferred, but not mandatory.

Start: Immediately.

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