

Master Thesis: Comparative Analysis of Encapsulants in Traditional vs. Modern Solar Modules

The Helmholtz Institute Erlangen-Nuremberg for Renewable Energies (HI ERN), part of the Forschungszentrum Jülich, researches and develops material- and process-based solutions for climate-neutral, sustainable and cost-effective utilization of renewable energies.

Aim: To explore the differences and similarities between EVA and POE encapsulants in both new and field-aged solar modules, employing a range of spectroscopic techniques including Near-Infrared Analysis (NIRA), Raman Spectroscopy, and Fourier Transform Infrared Spectroscopy (FTIR).

Project Steps:

- Acquire proficiency in operating spectroscopic instruments such as NIRA, Raman, and FTIR
- Conduct spectroscopic measurements on both EVA and POE encapsulants from new and field-aged solar modules
- Analyze and document the spectroscopic differences and similarities between these types of encapsulants, with particular attention to the comparison between the chemical structures in non-aging and aging samples.

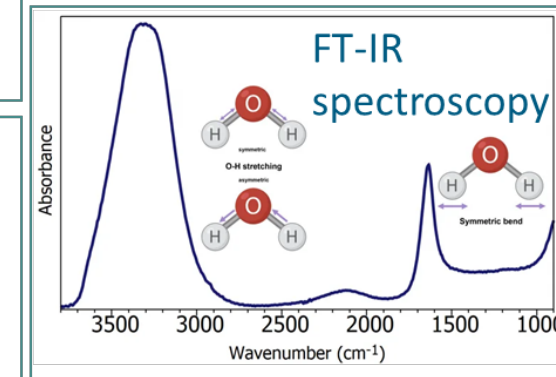
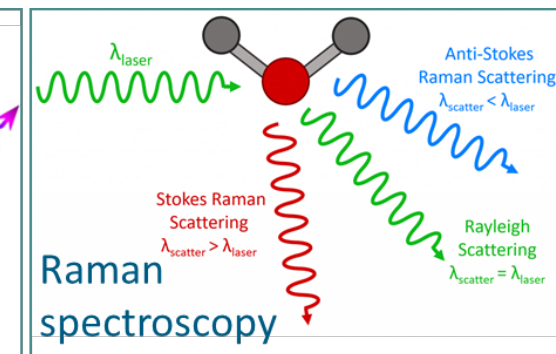
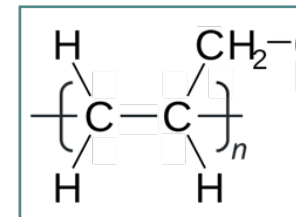
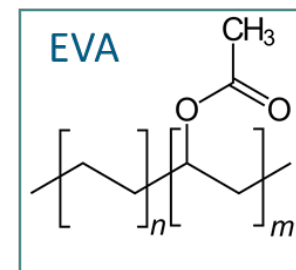
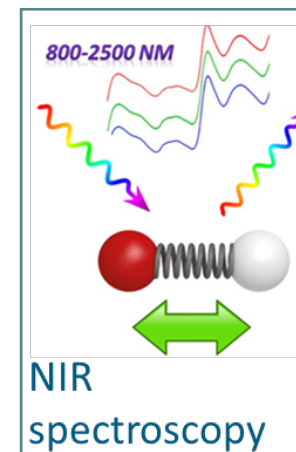
Qualifications:

- Student of Master Science, Chemistry or Physics (spectroscopy)
- Profound technical knowledge
- Experience in a programming language (Python) and data analysis is beneficial

Note: Students of MWT, NT, Energy Technology, Advanced Materials & Processes (MAP) can be directly examined. Students from other disciplines require an examiner from their department.

Sources:

- <https://analyticalscience.wiley.com/content/article-do/analytical-advantages-near-infrared-nir-spectroscopy>
- <https://www.edinst.com/blog/what-is-raman-spectroscopy/>
- <https://www.azom.com/article.aspx?ArticleID=22517>



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