Contribution ID : **152** Type : **Oral**

High-Resolution Macro ATR-FTIR Chemical Imaging Capability at Australian Synchrotron Infrared Microspectroscopy (IRM) Beamline

Thursday, 25 November 2021 12:00 (15)

This presentation aims to provide a summary on technical aspects and applications of our synchrotron macro ATR-FTIR microspectroscopy, unique to the Infrared Microspectroscopy (IRM) beamline at ANSTO–Australian Synchrotron.1 The device was developed by modifying the cantilever arm of a standard macro-ATR unit to accept Ge-ATR elements. Coupling synchrotron-IR beam to the Ge-ATR element (n=4), reduces the beam focus size by a factor of 4 (improving lateral resolution), and the mapping step size by 4 times relative to the stage step motion. As a result, the macro ATR-FTIR measurement at our IRM beamline can be performed at minimum projected aperture (sampling spot size) of 1-2 µm using a 20x objective, and minimum mapping step size of 250 nm, allowing high-resolution chemical imaging analysis with the resolution limit beyond those allowed for standard synchrotron-FTIR transmission and reflectance setups.

The technique has facilitated many experiments in a diverse range of research disciplinary. Here, there will be presentations based on macro ATR-FTIR technique in archaeology, electrochemistry (battery), biomedical and forensic sciences. Apart from these, we will provide additional applications in the fields of food and pharmaceutical science,2-4 single-fibre analysis,5-6 and dentistry.7

References:

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[4] D.M. Silva, et al., *Journal of Colloid and Interface Science*, **587**, 499-509 (2021).
[5] S. Nunna, et al., *Journal of Materials Chemistry A*, **5**, 7372-7382 (2017).
[6] C. Haynl, et al., *Scientific Reports*, **10**, 17624 (2020).
[7] P.V. Seredin, et al., *International Journal of Molecular Sciences*, **22**, 6510 (2021).

Level of Expertise

Expert

Presenter Gender

Woman

Pronouns

She/Her

Which facility did you use for your research

Australian Synchrotron

Students Only - Are you interested in AINSE student funding

Do you wish to take part in the Student Poster Slam

Condition of submission

Yes

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