



Contribution ID : 142

Type : Poster

## Current and future capabilities of the IRM beamline at the Australian Synchrotron, and guidance on applying for use of the facility.

Thursday, 25 November 2021 18:57 (1)

Infrared (IR) spectroscopy provides information on the chemical composition of materials, based on the absorption of infrared light by the vibrating bonds within molecular groups. IR microspectroscopy, using synchrotron light as the infrared source, enables this analysis to be performed on samples as small as  $1 - 2 \mu\text{m}$  in size, with a sensitivity not possible in the laboratory. ANSTO's synchrotron infrared microspectroscopy (IRM) beamline is equipped with a suite of accessories to enable the study of a diverse range of materials. This includes a sample heating and cooling stage, micro-compression cells for improved IR light transmission of dense materials, a liquid flow cell for the study of living organisms in a natural environment, and grazing angle optics for the analysis of thin film coatings on surfaces. The IRM beamline also has several attenuated total internal reflection (ATR) accessories that have been used for the study of challenging materials such as biofilms, carbon fibre, leaf surfaces and battery materials, where a thin section of the sample can not be prepared. More recent developments on the IRM beamline include the use of polarisation optics to determine molecular orientation in materials and operation with a far-IR detector to extend the spectral range to  $260 \text{ cm}^{-1}$ . Future plans for the IRM beamline include the motorisation of additional functions to assist with mail-in experiments and, in the longer term, the additional of nano-IR capability to the experimental endstation. Scientists interested in accessing the IRM beamline are encouraged to contact the IRM beamline team to discuss their research proposals.

### Level of Expertise

Expert

### Presenter Gender

Man

### Pronouns

He/Him

### 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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**Session Classification :** Poster Session

**Track Classification :** Instruments & Techniques