

# Monolayer/ Grazing Angle Specular Reflectance Accessory

A dual purpose sampling device designed to provide the means of in-situ FT-IR monolayer investigation of films at an air or liquid interface and grazing incidence angle measurements of thin film coatings on solid reflective surfaces.

## Monolayer/Grazing Angle Specular Reflectance Accessory

The Monolayer/Grazing Angle Specular Reflectance Accessory P/N GS19650 is a dual purpose sampling device designed to provide the means of in-situ FT-IR monolayer investigation of films at an air/liquid interface and grazing incidence angle measurements of thin film coatings on solid reflective surfaces. The accessory can be easily converted from one form to the other by simple changeover of the appropriate sample holder.

The range of grazing incident angles available with this accessory are from 8° to 85° with no stray light, on most spectrometer systems. Aperture stops are provided to redefine the beam profile, for prime position on samples at or near grazing angles, to enhance the performance.

In the monolayer mode a variety of monolayer systems including surfactants, proteins, detergents, oils, polymers and phospholipids in biological membranes can be studied in their native environment for information such as solvation,



### Key features

- > Grazing angle capability
- > Monolayer analysis
- > Continuously variable incidence angles from 8°–85° (dependant on spectrometer)
- > Volume of trough 8.9ml
- > Sample size 85 x 22mm liquid & 140 x 35mm solid
- > Built-in polarizer mount
- > Aperture stop facility for controlling the sampled area
- > Liquid film compression/expansion capability
- > Inert PTFE sample trough (liquids)

### Applications

- > Reflection-absorption spectra of solids
- > Langmuir-Blodgett films
- > Surfactant studies
- > Liquids in biological membranes
- > Semi-conductors
- > Paints
- > Resins
- > Polymer coatings
- > Matt surfaced samples
- > Molecular orientation of surfaces

molecular orientation, configuration and phase transition. A special liquid sampling trough, fabricated in PTFE, is used to contain the sample of interest. A rotatable polarizer mount and surface film stretching device are provided to aid in the studies. Any of Specac's P/N GS12000 series polarizers can be placed into the polarizer mount. The polarizer substrate chosen will determine the frequency range that can be observed in the Mid IR.

For solid surface sampling, an alternative flat sampling stage is used within the Monolayer/Grazing Angle accessory in place of the liquid sampling trough.

An important point about the sampling area requirement for the monolayer grazing angle accessory is that it is chiefly dependent on the incident angle of the beam of light being projected to the sample surface.

Whether it is a liquid sample or a solid surface, as the angle gets shallower (i.e. towards the 85° maximum for monolayer experiments) the spread of light across the surface gets larger as the elliptical shaped pool of light gets longer.

You therefore need a longer and thinner sample size area to make use of the available light, to maximise a sample signal. At grazing angles the amount of specularly reflected light can be very low in intensity and hence Specac would normally recommend that a sensitive detection system such as an MCT detector is used for measurement.

For liquid samples, the maximum length and width for a liquid surface is limited to 85mm and 22mm respectively. For the solid sampling platform, the maximum length of sample that can be accommodated is 140mm and the maximum width is 35mm.

The Monolayer/Grazing Angle accessory is baseplate mounted within a spectrometer sample compartment and an appropriate baseplate or fixings are supplied when ordered for a specific

spectrometer system. It is not compatible for attachment to a Benchmark® style baseplate.

However, in the majority of instances, the Monolayer Grazing Angle accessory can be adapted for use in a different spectrometer sample compartment by simple changeover to the appropriate baseplate.

## ordering information

### GS19650 Monolayer/Grazing Angle Accessory

consists of

Optical unit with baseplate

Horizontal sample stage

Aperture stops

Polarizer mount

PTFE sample trough

**Please specify make and model of spectrometer**

### Spares and Consumables

**GS19662** PTFE trough for monolayer mode samples

**GS19663** Aperture stops and holder for the Monolayer/Grazing Angle accessory