Keywords:- Selector™, Alignment, Realignment, Mirrors.

Realignment of Selector™ Accessory P/N GS19900

Throughput from a diffuse reflectance accessory is usually quite low in respect to an unobstructed beam. Typically, the Selector™ accessory P/N GS19900 with KBr as a reference material in the sample cup will give a signal responding to approximately 5% of overall throughput.

The only mirrors that can be adjusted on the Selector™ accessory is the final output mirror (for rotation and tilt) and the two ellipsoid mirrors. A Selector™ accessory will have been roughly aligned for a throughput before leaving Specac as new, but it needs to be finely tuned to best match the local environment within a specific spectrometer. If it is believed that the mirrors are not sending a signal correctly to the sample cup area, you will need to recreate a beam path to and from the sample cup area to realign the mirrors using a source of visible light.

Place the Selector™ on a flat surface and use a bright white light source in a darkened environment to project a beam of light to the first input fixed mirror. Over the sample cup surface area on the sample post, place a piece of fluorescent coloured tape (orange colour for example) and use the bright light source to trace the beam path from the source side of the Selector™ mirrors to the first ellipsoid mirror. This in turn should project an image of the light source onto the coloured tape surface. Ensure that the input beam of light is parallel to the first fixed mirror, such that the beam of light is projected correctly to the input ellipsoid from the first two fixed mirrors. At this stage adjust the input ellipsoid mirror only to bring the light spot into the middle of the sample cup. Raising and lowering the ellipsoid arm assembly by the micrometer screw will help adjust the spot of light for a focus. The light spot will get brighter (sharper) or dimmer (broader) depending on the focal point.

When the spot of light is established in the centre of the sample cup from the input side, move the light source to the other side of the Selector™ (output side). This is to project light back through the Selector™ accessory via the final output adjustable mirror to the output ellipsoid and onto the sample cup. By a combination of the final output adjustable mirror and the output ellipsoid mirror, bring the spot of light again centrally to the cup with the orange tape. When this is achieved you should now have roughly aligned the optical components such that a beam of light bought to the sample cup and then being diffusely reflected would have traced its way through the path of the output optical components towards the detector. Therefore you should now be able to place the Selector™ into the sample compartment of the spectrometer and finely tune it against the detection system.

Remove the fluorescent tape and use KBr powder as a reference material to register a signal throughput.

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