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Leitz

THE WALDMANN HOLLOW GLASS SPHERE

FOR QUANTITATIVE MORPHOLOGICAL AND CRYSTALLO-OPTICAL INVESTIGATIONS

This accessory to the universal rotating stages which can be mounted on our polarizing microscopes is for the morphological and crystallo-optical examination of crystals ranging in diameter from 1 to 11 mm. It consists a hollow sphere of optical glass, with a diameter of 27 mm. and 12 mm. bore. The space inside this sphere is filled up free from air bubbles with a suitable immersion fluid. The closure cap, with the object holder in place, seals the sphere without extending beyond its surface at any point. This renders the sphere capable of being turned under the microscope without limitation in every direction. The cap cuts off a spherical sector of only about 96°, leaving an angular space of about 264° available for observing the object.

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55-7/Engl.

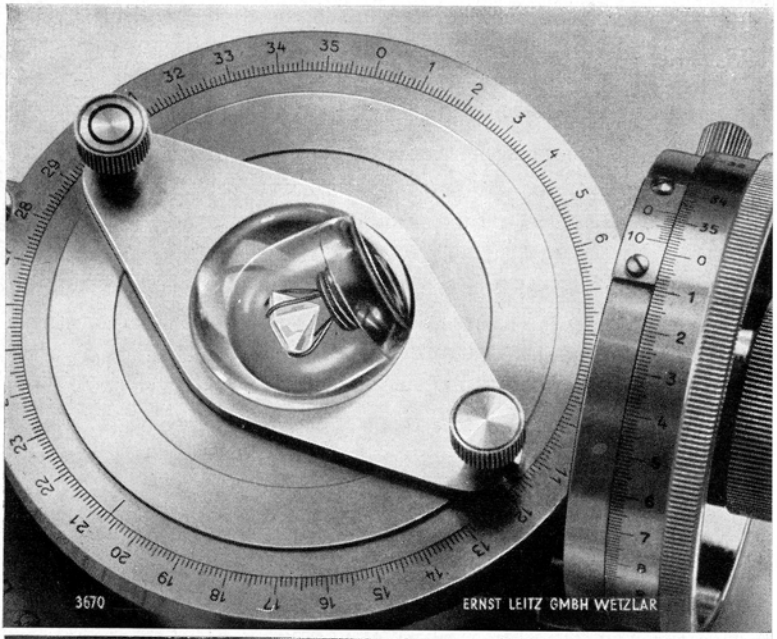
OBJECT HOLDERS ON CLOSURE CAPS FOR HOLLOW SPHERE

1. Closure cap with fixed glass pin for cementing on the object:
2. Closure cap with radially slidable glass pin. With this cap, the object can be brought into the centre of the hollow sphere. The pin is slid along by means of the accompanying key (4) which engages in the grooves (10). The object can be checked for position prior to inserting the cap into the sphere, with the aid of the cylindrical gauge (7) accompanying it. The height of this gauge is such as to bring the object centre within the sphere when it is exactly flush with the upper edge of the gauge, into the conical bore of which the cap is inserted.
3. Closure cap with cross pincers, for crystals of 5 to 11 mm. diameter. The pincers are opened and closed by means of key 4.

The closure caps are fitted to the glass sphere by means of the tongs (1), in which they can be securely held as slots (9) are provided in the caps.

ADVANTAGES OF THE HOLLOW SPHERE

- Transparent crystals of any to the stated maximum size can easily be brought into the centre of the sphere, where they can be examined without the risk of damage, and without preparatory measures.
- In the examination of thin sections, as has hitherto been customary, an initial position unfavourable for many components of the section is given by the plane of the section. By contrast, the sphere with its unlimited range of rotation allows a favourable initial position of the grain to be chosen, in addition to which the object can also be transposed on its holder.
- The angular space remaining accessible for observation in a plane of symmetry of the cap (about 26°), is considerably larger than in ordinary segments, in which a spherical belt of less than 90° only can be fully utilized for transmitted-light microscopy.
- The conoscopic examination method can also be employed at any time.



Hollow Glass Sphere in position on a universal rotating stage.

Components of the hollow glass sphere, in case:

1 tongs,
2 adapter ring for universal stage,
3 holder for hollow sphere,
4 key for vertical adjustment of closure caps,
5 wooden rings as supports for the sphere,
6 hollow sphere,
7 gauge for central orientation of the object to the hollow sphere (for closure cap with radially slidable glass pin),
8 closure plates.

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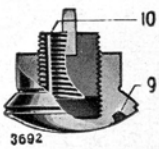
For morphological work in connection with the hollow sphere, the P 1 and P 2 achromatic objectives as well as the UM 1 to UM 4 special objectives, are suited. By rotation around H (A_2) and N (A_1), a surface is set relative to K (A_4). Then K (A_4) is the perpendicular to this surface*. Or else the directions of edges are set parallel to the K (A_4) axis, and the surface pole is constructed from the intersection of two edges. It is recommended to employ a net micrometer eyepiece in which the component lines are oriented parallel to the Nicol directions of vibration.

In crystallo-optical research, the form and position of the indicatrix in the crystal is of interest. For such work, planes of symmetry and axis penetration points are set as in the case of thin sections. Beyond this, it will almost always be possible to secure clear conoscopic images which permit determining the axial angles and the character of the double refraction in the diagonal position. It is of advantage to set the plane of the optical axis perpendicular to the K (A_4) axis.

The Waldmann hollow sphere can also be employed in the general examination of transparent objects in an immersion fluid. The advantages of this method in the case of jewels, grain preparations etc. are obvious. Where exact angular measurement is not essential, the hollow sphere may also be placed into the central aperture of the microscope stage, if desired with one of the two wooden rings supplied to prevent scratching the spherical glass surface. These rings also serve for conveniently setting up the sphere when filling in the immersion fluid.

The inside of the sphere, as well as the cap, can be easily cleaned by means of benzol or chloroform.



9 slot for tongs (1), 10 grooves for vertical adjustment of object holder by means of key (4).

COMPLETE SUPPLEMENTARY EQUIPMENT FOR UNIVERSAL ROTATING STAGE

Waldmann hollow glass sphere with tongs, adapter ring and holder for use on U-stage, key for vertical adjustment of closure caps, 2 wooden rings as supports for the sphere, centring gauge and 3 closure caps, in case

Codeword IIRUX

H etc.: after Reinhard
A etc.: after Berek.

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