POLARISING & ORE MICROSCOPES


Monocular Microscope


Binocular Microscope


Trinocular Microscope

Polarizing Microscopes

STEINDORFF


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Binocular Microscope


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INSTRUCTION MANUAL

POLARIZING & ORE MICROSCOPES

Model: NYMC62B00

NEW YORK MICROSCOPE COMPANY INC.
AKA MEL SOBEL MICROSCOPES
100A Lauman Ln., Hicksville, N.Y. 11801 Toll Free: (877) 877-7274 • Fax: (516) 801-2046
Web Site: www.microscopeinternational.com • www.nyscopes.com • E-mail: Info@nyscopes.com

INTRODUCTION

Polarizing Microscope is basically a regular microscope combined with a pair of polarizing filters, intermediate tube and optical compensator. This combination is made in order to observe the optical properties of double reflecting materials.

Ore Microscope is a combination of Polarizing Microscope and Incident Polarizing Illuminator. Its application is indispensable in Petrography, Crystallography, Mineralogy, Geology, Chemical Microscopy etc.

Incident Polarizing Illuminator is having an independent transformer and should be operated only when it is required.

UNPACKING

The Microscope is packed firmly inside molded FOAM. Microscope is packed in dismantled condition in three parts.

1. Microscope with Analyzer Head assembly
2. Incident Polarizing Illuminator (Optional)
3. Observation Tube

Please check that all the parts are as per your order.

The following accessories are also included in the box.

a) Allen key M2 - 2 Nos.
b) Filters in mount - 2 Nos.
c) Blue filter for condenser - One No.
d) Spare Halogen Bulb - One No.
e) Spare fuse Tube - One No.
f) Vinyl cover & Yellow Duster
g) Objective container - 3 Nos.
h) Eyepieces - 3 Nos.

Maintenance of Lens Surface

Dust deposited on the lens surface should be wiped out with a soft brush or blown off with a blower. Lightly and carefully wipe off finger prints or oily stains with a soft, clean, cotton cloth, gauze, or lens paper moistened with a suitable lens cleaner. Do not directly saturate the lens surface with cleaners that might creep into the optical system and impair their performance. Never use strong solvents to clean lens, mirrors and painted surfaces. When wiping the glass surface, do it lightly several times by sequentially using a new, unused portion of the cloth each time.

Replacement of Bulb

Before attempting replacement, unplug the power cord and wait for the microscope bulb to cool down, if it is in use. Remove the eyepieces from the ocular tubes and lay the microscope backward over the arm.

The bulb rating is 6V-20W halogen. Open the base cover plate by unscrewing the cover and replace the bulb.

Whenever removing or installing bulbs, it is a good practice to cover the bulb with folded cloth to obtain a firm grip on the bulb to prevent fingermarks on the glass and also to protect your hand if the bulb is accidentally broken.

Care of the microscope, When the microscope is not in use

When the Microscope is not in use for a short period, protect it from dust by covering it with a plastic vinyl dust cover and store it in a dry place. When the microscope is not used for a long period, clean it, then detach the objectives and eyepieces, and keep them in a plastic container. Put the objectives into the case and store them together with the eyepieces in a dessicator.

The Observation of Conoscope

Set the eyepiece, insert an analyzer and polarizer into the light path and adjust the condenser. Observe the Conoscope or interference figure by transmitting light with various destinations.

How to use

* Raise the Condenser to top most position.
* Insert the Bertrand lens in the light path.
* Set with 5X eyepiece & 40X Objective.
* Place a specimen on the stage and adjust the focus.
* Adjust the intensity of the light.

BERTRAND LENS

Polarizing Microscope consists of an in-tube and slide-in Bertrand Lens. Fitted with it is a field-limiting aperture which allows isolation of small features in the center of the field. The characteristic interference figures for small crystalline elements can be observed and studied. These effects occur only when both analyzer and polarizer are in the same optical path, the polarizer being set at 0 degrees. The in-tube design of the Bertrand Lens makes it possible to use it equally well with monocular, binocular and trinocular microscopes.

* FOR TRANSPARENT SPECIMEN SLIDES

  Polarization under transmitted light is used with sub-stage polarizer

* FOR OPAQUE SPECIMEN SLIDES

  Polarization under reflected/incident light is used with incident polarizer.

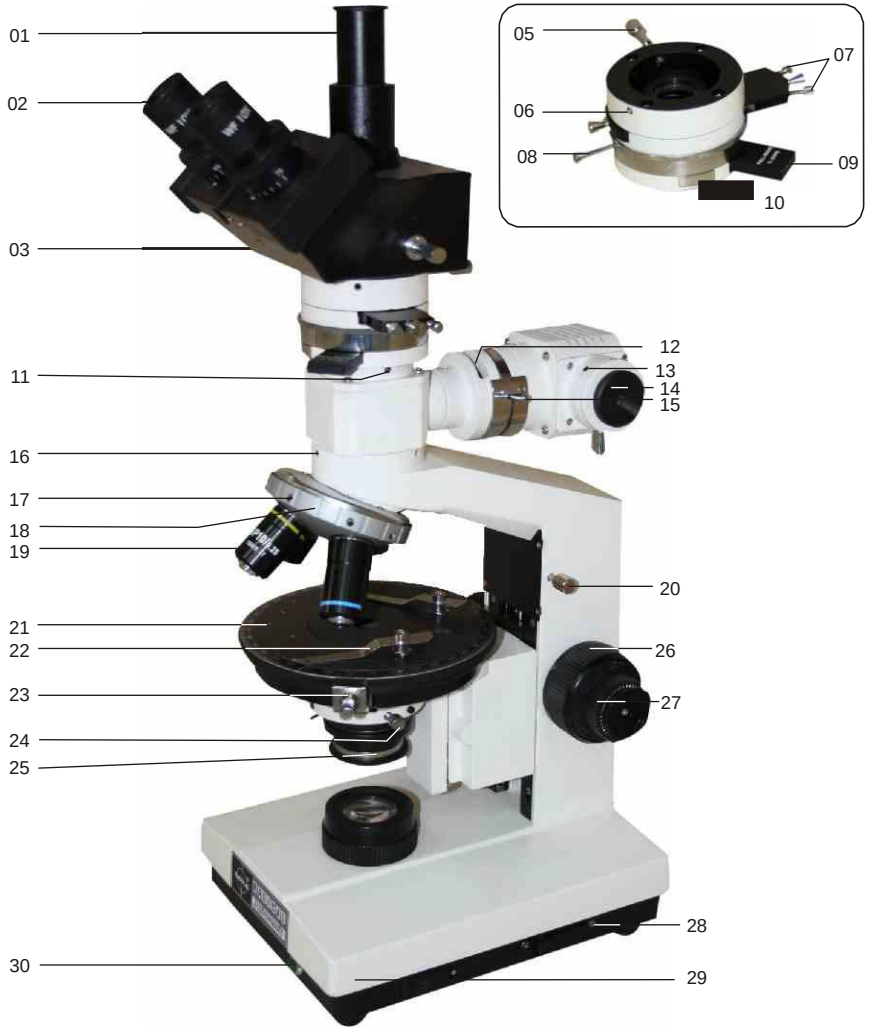
* FOR SEMI-TRANSPARENT SLIDES

  Both transmitted and reflected illuminators are used simultaneously.

TECHNICAL SPECIFICATIONS

Stage	Compact ball-bearing rotating stage 140 mm dia. graduated with vernier lock & stage specimen clips.
Focusing	Co-axial focusing is provided with coarse tension adjustment ring and graduated slow motion knobs. Adjustable safety lock is attached to prevent the breakage of specimen slides.
Illuminators	Transmitted Kohler illuminator with pre-centered 20W tungsten halogen source and integral electric transformer with intensity control. 3 amp. Fuse is concealed inside the base. Input voltage 220 Volts.
	Incident polarizing illuminator is provided with 6 Volts, 20 Watt halogen source and independent external transformer having intensity control for ore microscope.
Intermediate Tube	Built-in focusable Bertrand lens with center adjustable. Built-in analyzer removable from optical path. Analyzer can be rotated through 90° with a vernier reading to 6'. Compensator and /4 can be inserted in the tube as per requirement.
Compensator	Gypsum Plate (1st order red compensating plate, 560 nanometers) and /4 Mica Plate (145 nanometers) & Quartz Wedge (I-IV order).
Objectives	Stress-less flat Achromatic ORE Objectives. 4x / 0.10, 10x / 0.25 and 40x / 0.65 SL.
Eyepieces	WF 10x Pair and WF10x Cross.
Polarizer	Fully Rotatable Polarizer on a strain free N.A. 1.25 abbe condenser with iris-diaphragm and incident illuminator polarizer with filter slots for ore microscope.

PARTS LAY-OUT



The Observation of Orthoscope

Usually, to observe a tissue section by Microscope, the condenser should be lowered down and the Bertrand lens removed from the light path. Doing this way, the optical nature of minerals can be observed by means of getting them in visual field of transmitted parallel light.

How to Use

* Polarizer and Analyzer should be set on the orthogonal position
* Remove the analyzer from the light path.
* Bertrand lens should also be removed from the light path.
* Without eyepiece and slide, adjust the Sub Stage Condenser so as to have the same brightness with each objective, while observing through the Microscope.
* Set with 10X eyepiece & low power Objectives.
* Insert the Analyzer into the light path, then the field becomes dark.
* Rotate the stage having a slide with specimen, to observe under Microscope.
* Insert the Gypsum-Plate in order to change wave length of specimen in 1/4 degree, if required.
* With this you should be able to know a figure and color or refractive index of minerals by orthoscope.

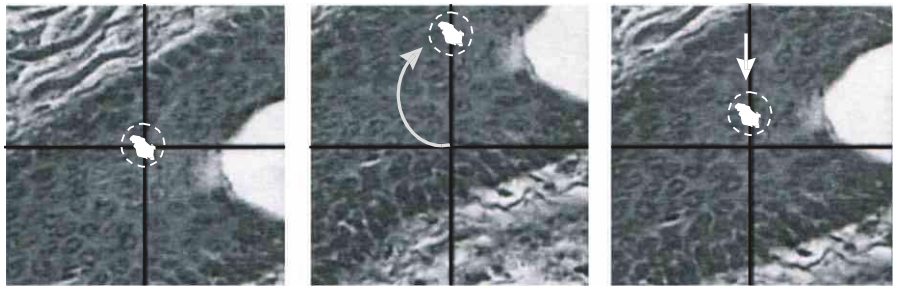
Adjustment of Centripetal

The center of object-stage should match with the crossed point of specimen in visual field. If this is not correct, then it should be adjusted by the centering screws, while rotating the stage.

Centering Procedure of Microscope Stage with Objects

Before inserting the polarizer and analyzer, the objectives on the nosepiece should be centered with the 10x objective, so that specimens will remain in the exact center of the view of field. Centering of the objective is important step for quantitative analysis of birefringence and optical path differences. The objective can be centered by adjusting the help of allen key screws on the nosepiece. Start by locating a small circular feature on a relatively simple bright field specimen in an area devoid of other distracting structures. Next, relocate the chosen feature to the center of the view field in the eyepiece cross-hair (see figure X). Rotate the stage through 180 degrees until the centered specimen feature is overlapped by one of the vertical eyepiece cross-hair (Figure Y). Using the centering screws, relocate the specimen feature to a distance approximately half way back to the crosshair center (Figure Z). Finally, move the specimen feature back to the center of the cross-hair (Figure X) and repeat the alignment sequence. After a few cycles, the specimen feature should be centered in the view field as the stage is rotated.

Microscope Objectives Centering Procedure



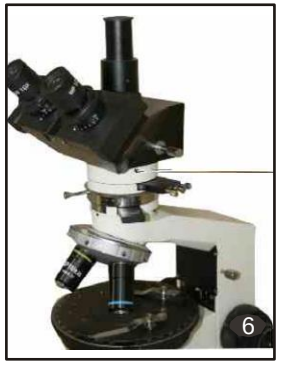
(Figure - X) (Figure - Y) (Figure - Z)

After the objective has been centered with respect to the microscope optical axis with the 10x objective, the other objectives should be sequentially centered to the stage.

LIST OF PARTS

1. Trinocular Tube for Camera
2. Eyepiece
3. Observation Head
4. Push-Pull Lever for Camera
5. Head Locking Screw
6. Centering Screws for Observation Head
7. Centering Screws for Bertrand Lens
8. In-out pin for Analyzer
9. Compensating Slide
10 Analyzer Scale/Vernier
11. Locking Screws for Analyzer assembly
12. Filter Slot
13. Centering Screw for Bulb Holder
14. Bulb Holder (incident lamp)
15. Lens for Incident Polarizer
16. Locking Screw for Incident Lamp
17. Centering Screw for Objective
18. Revolving Nosepiece
19. Microscope Objectives
20. Stage Stopper Lock
21. Rotary Stage
22. Stage Slide Clips
23. Rotary Stage Lock
24. Locking Knob for Condenser
25. Polarizing Rotating Ring
26. Coarse Focusing Knob
27. Fine Focusing Knob
28. Light Intensity Controller
29. Microscope Base
30. Mains Indicator

ASSEMBLY OF POLARISING MICROSCOPE



ASSEMBLED MICROSCOPE

Sequence of Assembly

1. Basic Microscope Body
2. Analyzer Head Assembly and Observation Head
3. Place Analyzer Assembly on Microscope Body
4. Fix analyzer assembly with three locking screws.
5. Place Observation Head on analyzer assembly
6. Fix Observation Head with three Centering & locking screws.

The Microscope is now ready for observation under Polarized Light

ASSEMBLY OF ORE MICROSCOPE

ASSEMBLED MICROSCOPE

Sequence of Assembly

1. Basic Microscope Body
2. Analyzer Head Assembly, incident illuminator & Observation Head.
3. Place & fix Incident illuminator on Microscope Body.
4. Place & Fix analyzer assembly with three locking screws on incident illuminator.
5. Use allen key for tightening the locking screw.
6. Fix Observation Head with three Centering & locking screws.

The Microscope is ready for observation under transmitted & incident Polarized Light