

IESO 2026 — TURIN
PRACTICAL TEST 2 — OPTICAL PETROGRAPHY

Time: 75 minutes • Questions: 19 • Score: 19 points • Read all the data before answering. Only one correct answer for all questions.

INSTRUCTIONS

You have two thin sections, SLIDE A and SLIDE B. Observe them under the polarizing microscope, first using a low magnification, then using either the plane-polarized light (PPL) setting or the crossed polars (XPL) setting. You should use the *Polarizing Microscope & Mineral Identification Guide* for the observation and identification of minerals in thin sections.

Equipment provided: polarizing microscope, thin sections A and B, mineral identification guide, pencil.

FIRST LOOK — texture (low magnification)

1. In SLIDE A, the overall texture is best described as... (1 pt)
 - A) fine-grained, all crystals present a similar tiny size
 - B) crystals with a clear parallel banding
 - C) coarse crystals of roughly similar size, with no preferred orientation and showing a crystallisation sequence
 - D) rounded grains set in a fine matrix
2. In SLIDE B, the overall texture is best described as... (1 pt)
 - A) vesicular (full of holes)
 - B) crystals with a clear preferred orientation, elongated or in bands
 - C) glassy, with no visible crystals
 - D) randomly arranged crystals showing a crystallisation sequence
3. Which slide shows the stronger preferred mineral orientation (incipient foliation)? (1 pt)
 - A) A
 - B) B
 - C) both equally
 - D) neither

PLANE POLARIZED LIGHT (one polarizer)

4. Pleochroism (a change of colour as the stage rotates in PPL) is typically shown by... (1 pt)
 - A) biotite
 - B) garnet
 - C) plagioclase
 - D) quartz
5. A mineral showing one set of thin, closely-spaced, parallel cleavage traces could be a... (1 pt)
 - A) quartz
 - B) pyroxene
 - C) feldspar
 - D) mica

CROSSED POLARIZED LIGHT (both polarizers)

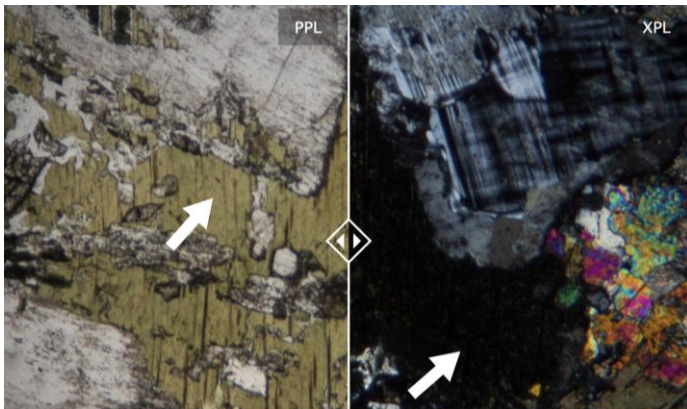
6. The position at which a crystal goes fully dark as the stage is rotated under XPL is called... (1 pt)
 - A) cleavage
 - B) extinction
 - C) pleochroism
 - D) twinning

7. In a colourless, low-relief mineral, repeated parallel (polysynthetic) twinning under XPL indicates... (1 pt)

- A) quartz
- B) K-feldspar
- C) plagioclase
- D) biotite

MINERAL DETECTIVE - identify from pictures

The pictures below all show thin sections under both PPL and XPL. Where more than one mineral is visible, please refer to the one indicated by an arrow.

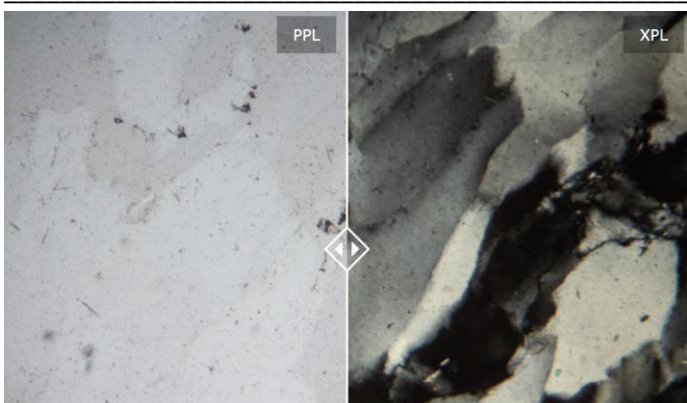


8. Which property can you detect in the PPL section? (1 pt)

- A) Cleavage
- B) Euhedral mineral shape
- C) A clear crystallisation sequence
- D) None of the above

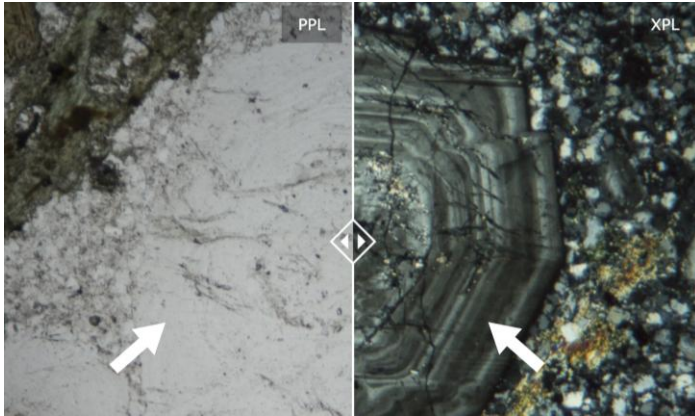
9. What mineral is most probably present in these sections? (1 pt)

- A) Amphibole
- B) Muscovite
- C) Biotite
- D) Garnet



10. What mineral is most probably present in these sections? (1 pt)

- A) Quartz
- B) Pyroxene
- C) Plagioclase
- D) The above sections are not of a mineral, but rather of an amorphous formation

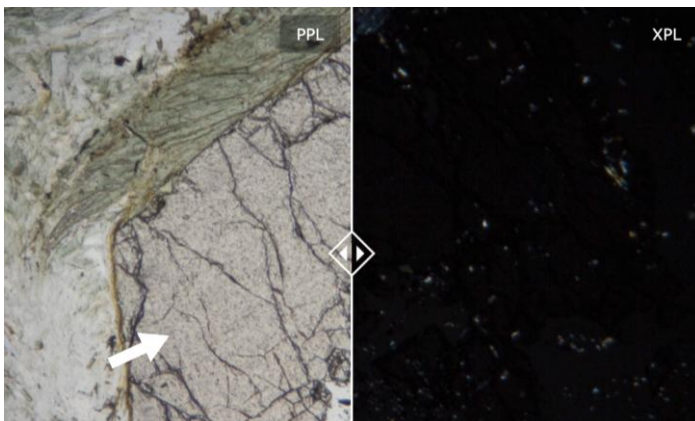


11. Which property can you detect in the XPL section? (1 pt)

- A) High-order interference colors
- B) Compositional concentric zoning
- C) Anhedral mineral shape
- D) All of the above

12. What mineral is most probably present in these sections? (1 pt)

- A) Pyroxene
- B) Plagioclase
- C) Garnet
- D) K-feldspar

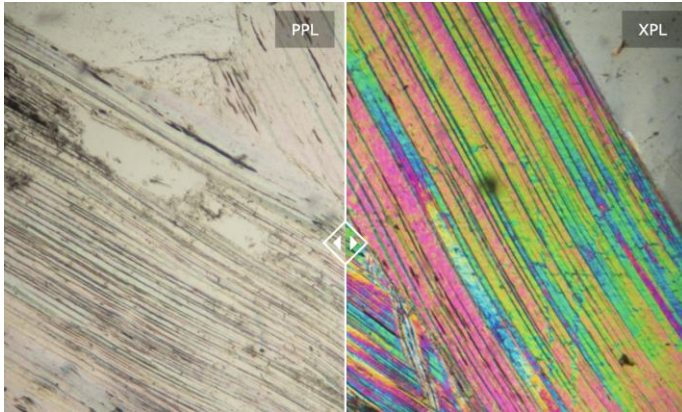


13. Which property can you detect in these sections? (1 pt)

- A) Severe damage in the XPL section
- B) Anhedral mineral shape
- C) Clear cleavage
- D) None of the above

14. What mineral is most probably present in these sections? (1 pt)

- A) Plagioclase
- B) Pyroxene
- C) Garnet
- D) None of the above



15. What mineral is most probably present in these sections? (1 pt)

- A) Muscovite with biotite inclusions
- B) Biotite with muscovite inclusions
- C) Pure biotite
- D) Pure muscovite

CONCLUSIONS

16. Large crystals of similar size showing a crystallisation sequence, with no preferred orientation, indicate a rock that... (1 pt)

- A) cooled rapidly at the surface (volcanic)
- B) recrystallised under directed stress (metamorphic)
- C) was deposited grain by grain (sedimentary)
- D) crystallised slowly at depth (plutonic)

17. Foliation, aligned or elongated grains and signs of deformation indicate a rock that is... (1 pt)

- A) metamorphic
- B) plutonic
- C) pyroclastic
- D) evaporitic

18. Putting the evidence together, SLIDE A is most likely... (1 pt)

- A) plutonic
- B) pyroclastic
- C) metamorphic
- D) evaporitic

19. And SLIDE B is most likely... (1 pt)

- A) evaporitic
- B) metamorphic
- C) pyroclastic
- D) plutonic