

## Other Properties of Biaxial Minerals

- Pleochroism
- Extinction
- Sign of Elongation
- Refractive Indices
- Dispersion

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## Pleochroism

- \_\_\_\_\_
- To completely describe the pleochroism of biaxial minerals it is necessary to specify \_\_\_\_\_ colours, each of which corresponds to the light vibrating parallel to \_\_\_\_\_ indicatrix axis.
  - e.g., for hornblende, pleochroism may be described as:
    - **X** = yellow
    - **Y** = pale green
    - **Z** = dark green

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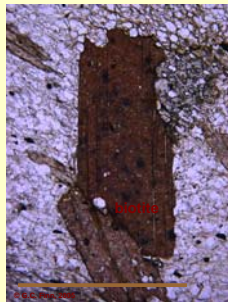
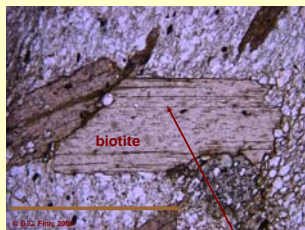
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## Biotite Pleochroism



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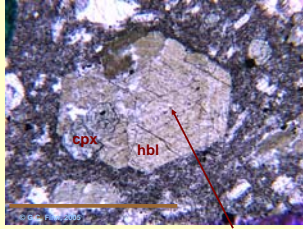
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## Hornblende Pleochroism



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## Pleochroism

- Steps for the identification of the pleochroic scheme for biaxial minerals outlined on p. 101 of Nesse.
- To record the pleochroism requires that you obtain an interference figure and determine the vibration directions.

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## Extinction

- The type of extinction (parallel, inclined symmetrical) observed for biaxial minerals is a function of \_\_\_\_\_ and \_\_\_\_\_ of the mineral
- We will examine the types of extinction for various minerals when discussing one presenting characteristics later.

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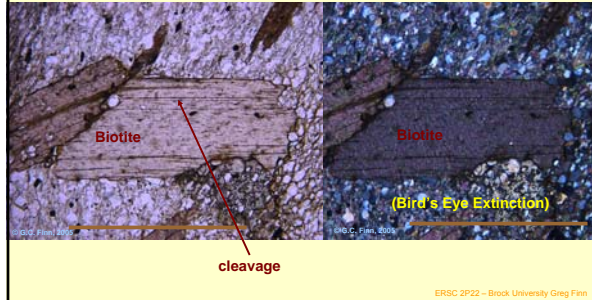
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## Parallel Extinction



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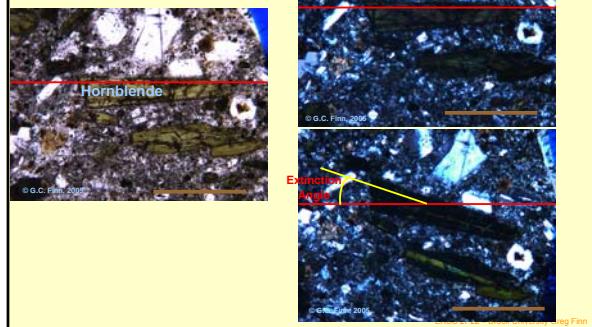
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## Inclined Extinction



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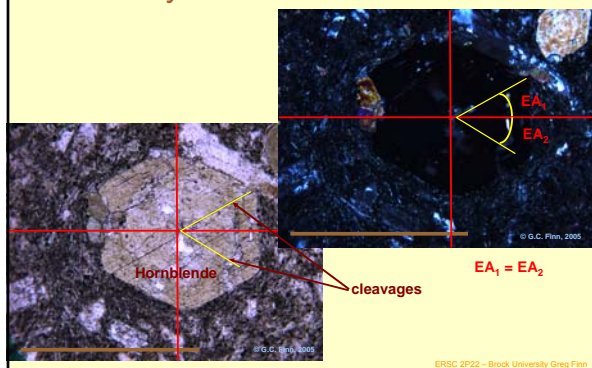
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## Symmetrical Extinction



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## Sign of Elongation

- Sign of elongation is dependent on which indicatrix axis is \_\_\_\_\_ to the long dimension of the elongate mineral, grain or fragment.
  - if \_\_\_\_\_ is  $\parallel$  length - mineral is **length fast**
  - if \_\_\_\_\_ is  $\parallel$  length - mineral is **length slow**
  - if \_\_\_\_\_ is  $\perp$  to length, mineral is either **length fast** or **length slow** depending on whether **X** or **Z** is horizontal.

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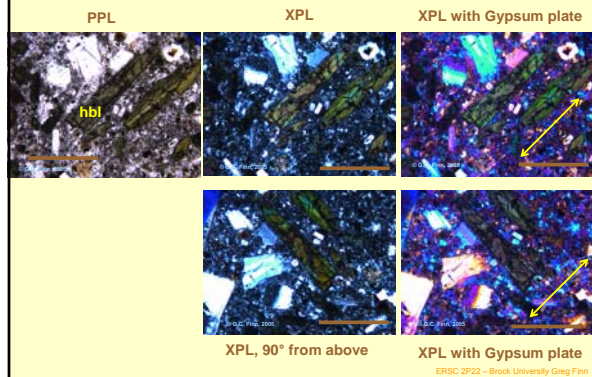
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## Hornblende Sign of Elongation



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## Indices of Refraction

- Necessary to measure/determine \_\_\_\_\_ different indices ( $n_\alpha$ ,  $n_\beta$ ,  $n_\gamma$ ) to describe biaxial minerals
- Accomplished using grain mounts, with the procedure similar to that used for isotropic and uniaxial minerals
- \_\_\_\_\_ to measure/determine indices in thin section, but comparisons of the indices for various minerals are possible

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## Dispersion

- Indices  $n_\alpha$ ,  $n_\beta$ , and  $n_\gamma$  for biaxial minerals \_\_\_\_\_ for different wavelengths of light
- As a result the value for the **2V** angle and the orientation of the indicatrix for a given mineral will vary with the wavelength of light
- Variation in the \_\_\_\_\_ of the **2V** is called optic axis dispersion.

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## Dispersion

- Variation in the \_\_\_\_\_ of the indicatrix is indicatrix or bisectrix dispersion.
- Dispersion is visible as colour fringes developed along the isogyres of the interference figure. Depending on the intensity of the colour fringes, the dispersion is weak, moderate or strong.

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