

**Igneous Textures and Classification**

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**Igneous Textures**

- The texture of a rock is defined as:
  - \_\_\_\_\_
- In the case of the igneous rocks the texture is largely determined by the \_\_\_\_\_ of the magma that resulted in the specimen being examined

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**Igneous Textures**

- Examining igneous rocks reveals that they may consist of:
  - \_\_\_\_\_ grains which may be;
    - large or small or a mixture of both
    - \_\_\_\_\_
  - solid \_\_\_\_\_
    - \_\_\_\_\_
  - individual \_\_\_\_\_ packed together
    - \_\_\_\_\_

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### Igneous Textures

- The rate at which a magma cools controls:
  - \_\_\_\_\_
  - \_\_\_\_\_
- \_\_\_\_\_ = glassy
- \_\_\_\_\_ = crystalline
- \_\_\_\_\_ = mix of both

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### Igneous Textures

- For slow cooling many mineral grains \_\_\_\_\_ and \_\_\_\_\_, with the rate of cooling controlling the final size of the mineral grains
- Grain size
  - \_\_\_\_\_ < 1 mm
    - \_\_\_\_\_ (cannot be distinguished with unaided eye)
  - \_\_\_\_\_ 1-5 mm
    - \_\_\_\_\_
  - \_\_\_\_\_ > 5 mm
    - \_\_\_\_\_

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Glassy =  
Fast  
Cooling

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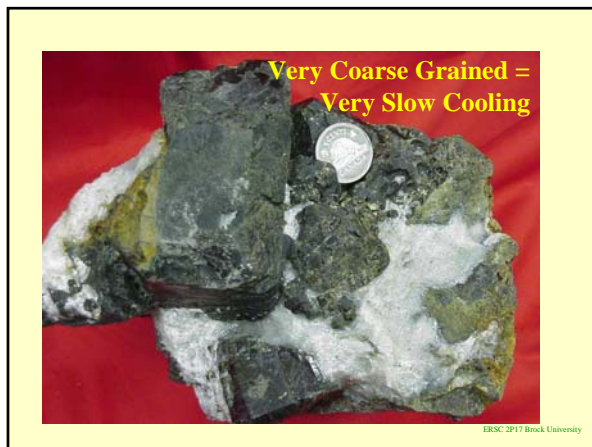
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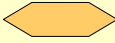


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**Igneous Textures**

- The degree of crystal development reflects how a mineral nucleated and grew and the ratio of solid to liquid at the time of growth
- Grain shape
  - \_\_\_\_\_ • composed of good crystal faces 
  - \_\_\_\_\_ • some good crystal faces 
  - \_\_\_\_\_ • no good crystal faces 

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### Igneous Textures

- Some igneous melts cool in two stages, reflecting changes in the conditions under which the magma exists
- Resulting rocks typically have two different sizes of grains and are called \_\_\_\_\_
- The large grains are referred to as \_\_\_\_\_ and they are set in a finer grained \_\_\_\_\_

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### Porphyritic Textures

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### Porphyritic Textures

Large grains (Phenocrysts) in a finer grained matrix

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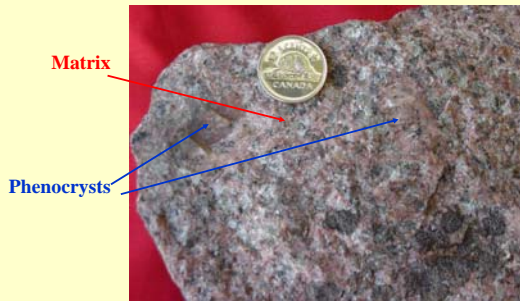
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### Porphyritic Textures

Large grains (Phenocrysts) in a finer grained matrix



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### Igneous Textures

- Vesicles - \_\_\_\_\_
- Amygdules - \_\_\_\_\_



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### Plutonic Rock Types

(Intrusive Rocks)

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### Syenite

- **Major Minerals:**  
- \_\_\_\_\_  
- \_\_\_\_\_
- **NO QUARTZ**
- **Accessories:**  
• \_\_\_\_\_, \_\_\_\_\_



Hornblende Syenite



Nepheline Syenite

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### Granodiorite

- **Major Minerals:**  
- \_\_\_\_\_  
- \_\_\_\_\_
- **up to 10% quartz**
- **Accessories:**  
- \_\_\_\_\_, \_\_\_\_\_



PT-190



BUPI 67

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### Granite

- **Major Minerals:**  
- \_\_\_\_\_  
- \_\_\_\_\_  
- \_\_\_\_\_
- **Accessories:**  
- \_\_\_\_\_, \_\_\_\_\_



BUPI 59



2002-6



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### Gabbro

- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_, \_\_\_\_\_,
  - \_\_\_\_\_



2000-2

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### Ultramafic

- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_



PT-175

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## Volcanic Rock Types

(Extrusive Rocks)

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### Rhyolite



- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_, \_\_\_\_\_,
  - \_\_\_\_\_

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### Dacite



- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
  - up to 15% \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_, \_\_\_\_\_,
  - \_\_\_\_\_

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### Andesite



- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_
- **Minor:**
  - \_\_\_\_\_,
  - \_\_\_\_\_

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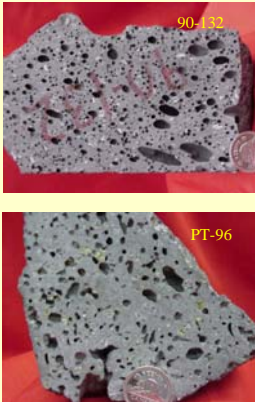
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## Basalt

- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_, \_\_\_\_\_

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## Ultramafic

- **Major Minerals:**
  - \_\_\_\_\_
  - \_\_\_\_\_
- **Accessories:**
  - \_\_\_\_\_,
  - \_\_\_\_\_

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Simplified Classification of Igneous Rocks						
	Quartz > 5%		No Quartz, No Feldspathoid		Feldspathoid > 5%	
	Coarse	Fine	Coarse	Fine	Coarse	Fine
Feldspar K-feldspar > plagioclase	Granite	Rhyolite	Syenite	Trachyte	Nepheline Syenite Leucite Syenite	Phonolite Leucite Phonolite
Plagioclase > K-feldspar	Granodiorite	Dacite	Monzonite	Lalite	Nepheline Monzonite	
Plagioclase (oligoclase or andesine)	Tonalite	Quartz Andesite	Monzodiorite	Lalite Basalt	Nepheline Diorite	
Plagioclase (labradorite to anorthite)	Quartz Diorite	Andesite	Gabbro Peridotite (of dominant)	Basalt	Nepheline Gabbro	Tephrite
No Feldspar			Pyroxenite Hornblendite	Kornalite	Ijolite	Nephelinite

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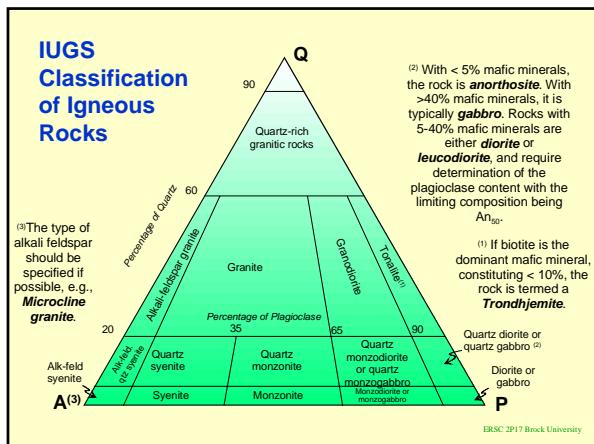
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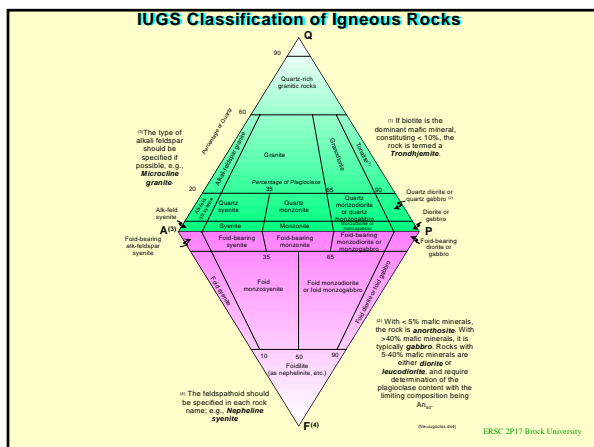
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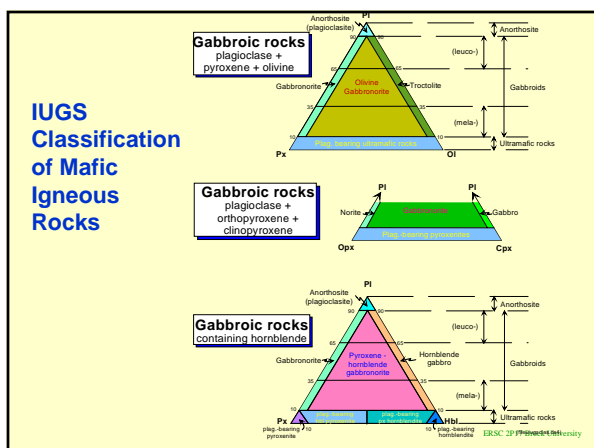
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