

Igneous Rock Lab

Background: Igneous rock is one of the three (3) main types of rocks. Igneous rock is formed by magma or lava becoming cooled and solidifying. The rock may form with or without crystallization below the surface or on the surface of the planet. Remember that magma is molten rock below the Earth's surface while lava is molten rock that has erupted onto the Earth's surface through a volcano or fissure (crack) in the Earth's surface. Lava cools much more quickly than magma because it is on the surface. Cooling rates influence the texture of igneous rocks: quick cooling will give fine grains while slower cooling will result in coarse grains. Remember that igneous rocks are classified based on their texture and composition.

Vocabulary:

- magma - molten rock found beneath the surface of a planet
- crystallization - the formation of solid crystals precipitating from a solution; may be melted or deposited by gas
- intrusive - intrusive refers to igneous rock that has crystallized from molten magma below the surface of the Earth (also called plutons after Pluto the Roman God of the Underworld)
- extrusive - extrusive refers to igneous rock that is formed from hot magma when it flows out (extrudes) onto the surface of the Earth as lava or explodes through a pyroclastic flow

Materials: ESRT

Directions: Using the ESRT's answer the following questions:

1. What is the texture of rhyolite? _____
2. What is the crystal size of rhyolite? _____
3. Is rhyolite intrusive or extrusive? _____
4. Plutonic is also referred to as intrusive or extrusive? _____
5. Estimate the percentage of each mineral in rhyolite:
 - a. _____% Potassium Feldspar
 - b. _____% Quartz
 - c. _____% Amphibole (hornblende)
 - d. _____% Biotite (hornblende)
6. List the minerals in andesite. _____
7. What is the texture of scoria? _____
8. Name a fine-grained igneous rock with no quartz. _____
9. Name a coarse-grained igneous rock with no quartz. _____

10. Which mineral is present in much greater quantities in peridotite than in gabbro?

11. What is the texture of granite? _____

12. What is the crystal size of granite? _____

13. Is granite intrusive or extrusive? _____

14. Estimate the percentage of each mineral in gabbro:

- | | |
|--------------------------------|---------------------|
| a. _____% Plagioclase Feldspar | b. _____% Pyroxene |
| c. _____% Olivine | d. _____% Amphibole |
| e. _____% Biotite | |

15. Name a fine-grained textured igneous rock with no pyroxene. _____

16. Name a coarse-grained textured igneous rock with no pyroxene. _____

17. Contrast rhyolite and basalt in the following categories:

- | | |
|---|-------------------------|
| a. density | b. color |
| c. percentage of Iron (Fe) & Magnesium (Mg) | d. percentage of Quartz |

18. Name a felsic intrusive rock. _____

19. Name a light-colored plutonic rock. _____

20. Felsic rocks generally have a _____ color.

21. Mafic rocks generally have a _____ color.

22. Intrusive igneous rocks have large or small mineral crystals because of slow or fast cooling? _____

23. Name four (4) felsic igneous rocks:

- | | |
|----------|----------|
| a. _____ | b. _____ |
| c. _____ | d. _____ |

24. Name four (4) mafic igneous rocks:

- | | |
|----------|----------|
| a. _____ | b. _____ |
| c. _____ | d. _____ |

25. Name a plutonic mafic igneous rock. _____
26. Which igneous rock cooled slowly underground and contains mostly quartz and potassium feldspar? _____
27. How does the percentage of aluminum in an igneous rock affect its density?

28. Which igneous rock is fine-grained and has a lot of pyroxene? _____
29. Name a coarse-grained igneous rock composed mostly of olivine. _____
30. Name an intrusive, dense, dark igneous rock. _____
31. What two (2) characteristics are used to classify igneous rocks? _____
32. Where an igneous rock formed can be inferred from the rocks _____.
33. What causes the differences of texture in igneous rocks? _____
34. Fill in the blanks on the following chart:

Rock Name	Formed from lava or magma	Cooling Rate (very fast, fast or slow)	Crystal Size (non-crystalline, small, or large)	Texture (glassy, fine, or coarse)
Rhyolite	Lava	Fast	Small	Fine
Gabbro		Slow		Coarse
Basalt		Fast		Fine
Pumice	Lava		Non-crystalline	
Obsidian		Very fast		
Granite	Magma			
Diorite				
Dunite				
Andesite				

*****When doing the lab report write-up, be sure to follow the guidelines.*****