

Review of Extrusive Igneous Rocks

The following homework is based on the lab lectures for labs 6,7, and 8. The PowerPoint versions are available on the web pages.

- ___ 1. (T-F) Volume percent abundance is an important means of rock classification
2. Some of the largest plutonic bodies in the world include Bushveld (South Africa), Skaergård (East Greenland), Duluth Gabbro, Muskox (Northwest Territories, Canada), Great Dike (Zimbabwe), and the Stillwater Complex (Montana). What type of intrusion are they?
_____ intrusions
- ___ 3. (T-F) The plagioclase composition of gabbro is $< An_{50}$.
- 4-5 The major minerals in harzburgite are 4) _____ and 5) _____.
6. Tonalite with $M < 10$ may be called _____.
7. For anorthosite, $P/(A+P) > \underline{\hspace{2cm}}$.
8. Diorite is the intrusive equivalent of _____.
- ___ 9. (T-F) Diabase and gabbro are often found together.
10. Norite contains essential orthopyroxene. How may the orthopyroxene sometimes be recognized in hand specimen? _____
-
- ___ 11. (T-F) Major batholith complexes are composed of a homogeneous rock type throughout the entire complex.
- ___ 12. (T-F) A batholith complex which is tonalite to granodiorite in composition likely overlies basaltic crust.
- ___ 13. (M-C) Granitic batholiths may be found in which geologic environment?
A. Back-arc environments
B. Non-arc environments
C. Tectonic environment similar to arc volcanic rocks
D. All of the above
- ___ 14. (T-F) Using an orogenic event as a temporal reference, mafic batholiths are generally emplaced earlier than felsic batholiths.

15. Who suggested the presence of a “quartz diorite line” in western U.S. batholiths?

16. Why do late-stage granitic magmas often contain much larger percentages of water than the original magma?

____ 17. (M-C) In addition to water, pegmatitic magmas are enriched in:

A. Volatiles, including carbon dioxide, and alkalies

B. Very large cations - U, Ba, Pb, etc.

C. Very small cations - Li, Be

D. Any of the above

18-19. The loss of volatiles from a pegmatitic magma is likely to produce an aplite. What two physical effects does the loss of volatiles cause?

18) _____

19) _____

20. A “cloudy” appearance on either orthoclase or microcline is due to what? _____

21. The presence of P in magma usually produces what mineral in granitic rocks? _____

22. What is the most likely cause of foliation in granite? _____

23. Tabular bodies, generally a few inches to tens of feet long, that occur in plutonic rocks, which may be lighter or darker in color than surrounding rock, are called _____

24-25. How is the mafic composition likely to change on going from a granodioritic magma to a granitic magma? 24) _____

Why? 25) _____

26-27. Mafics in nepheline syenite are alkali rich. What species of each of the following groups are likely to be present?

26) Pyroxene _____

27). Amphibole _____

28. What is the required feldspathoid content of ijolite? F = _____

29. What mafic mineral is essential in ijolite? _____

30. Describe the usual mineralogy of jacupirangite

31. What has convinced many petrologists that silicates and carbonatites originate together?

32. What are two other names for phonolite?

33. Serpentine minerals are common weathering products of what two minerals?

___ 34. (T-F) Magnetite is a frequent opaque accessory mineral in ultramafic rocks.

35. In peridotite the mafic content is what? _____

36. How is chromitite different than most other ultramafic rocks?

___ 37. Kimberlite pipes are enriched in which of the following elements?

A. Aluminum

B. Phosphorus

C. Potassium

D. Sodium

___ 38. (T-F) The composition of lamprophyre is similar to that of alkaline olivine basalt.

