

GY111 Earth Materials Laboratory Exercise 2: Igneous Rocks

Igneous Rocks Problem Set

Problem 1: Define the following terms

1. Aphanitic
2. Phaneritic
3. Porphyritic
4. Phenocryst
5. Groundmass

Problem 2: In the space below describe how a Basalt porphyry would form from a magma. Assume that the phenocrysts are Ca-Plagioclase crystals. You may use a sketch to help illustrate your answer.

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Problem 3: Define the following terms:

1. Scoria
2. Pumice
3. Vesicles
4. Obsidian
5. Tuff

Problem 4: Why do pegmatites form such large crystals?

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Problem 5: You may have noticed that the igneous rock samples that we use for lab lacks any examples of ultramafic extrusive (volcanic) rocks termed Komatiites. Komatiites are rarely found on Earth and are always very old, dating back to Precambrian time (> 540 Ma). Why don't Komatiites form now? What must have been different about Earth back in Precambrian time?

Problem 6: During the crystallization of a large magma chamber at great depth (i.e. slow cooling) assume that Bowen's Reaction Series controls the order of crystallization of silicate minerals. In the below diagram fill in the expected composition and mineral content of each layer assuming that as each crystal formed it settles to the bottom of the chamber forming a layered intrusion (i.e. fractional crystallization):