# Title Information

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Metamorphic Rock Identification Lab

July 6, 2020

N/A

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# Data and Observations / Calculations

## Exercise 1: Identification of Igneous Rocks

### Data Table 1. Metamorphic Rock Characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Specimen #** | **Foliation** | **Grain Size** | **Distinctive Features** | **Rock Name** |
| 43 | foliated | No visible grains | Flat, dull grey color | Slate |
| 44 | foliated | Fine grained | Flat, red and brown colors, slightly metallic, schistocyte | Phyllite |
| 45 | Non-foliated | Medium grained | Round, very metallic/shiny | quartzite |
| 46 | foliated | Medium grained | Flat, separated white and grey alternating layers, a little metallic | Gneiss |
| 47 | Non-foliated | medium grained | Glimmer, triangular shape, grainy, dark burnt orange and white fuzzy color | Quartzite |
| 48 | Non-foliated | Coarse grained | Shiny, white, large grains, triangular pyramid shape | Marble |
| 49 | Non-foliated | Fine grained | Dull grey not as dull as rock 43, 3d geometric diamond shape | Hornfels |
| 50 | Non-foliated | No visible grains | Shiny, leaves dust/pigment everywhere, black | Anthracite Coal |

## Photo Requirements

N/A: Keep Rocks for Future Experiments

# Lab Question Answers

## Exercise 1 Questions

1. **What is recrystallization? Which specimen exhibits the recrystallization of the mineral calcite?**

Recrystallization is a process where smaller mineral crystals of a parent of “protolith” rock convert to fewer larger crystals in the metamorphic form (HOL Lab, 2020). Limestone and marble are two different specimen that exhibit the recrystallization of the mineral calcite. The calcite in limestone is microscopic in crystal size while the calcite crystals in marble are clearly visible to the naked eye (HOL Lab, 2020).

1. **What is a protolith? Which specimen has sandstone as a protolith?**

A protolith is a parent rock (HOL Lab, 2020). This means that whatever metamorphic rock there is has a protolithic form which this new metamorphic rock was formed. The protolith is one of the three types of rocks to each metamorphic rock: Igneous, sedimentary or metamorphic. Quartzite is the specimen that has sandstone (a sedimentary rock) as it protolith (HOL Lab, 2020).

1. **What are foliations? Which metamorphic process, regional or contact, results in foliations? Which specimens exhibit foliations?**

Foliation is the layering type of the rock. Based on whether the rock has a pattern in layering is what type of foliation is exhibited. Foliated rocks exhibit layers (HOL Lab, 2020). Non-Foliated rocks “lack layers” (HOL Lab, 2020). Foliation is associated with regional metamorphism (HOL Lab, 2020). Non-foliated metamorphic rocks are a result of either regional or contract metamorphism (HOL Lab, 2020). Specimens such as Slate, Phyllite, Schist, and Gneiss exhibit foliations (HOL Lab, 2020). Among many things Foliated metamorphic rocks can display: slaty cleavage (meaning they are flatter), have a wavy texture, and even have different colored bands (HOL Lab, 2020).

1. **What is schistosity? Which specimen exhibits schistosity? What metamorphic mineral process is responsible for the specimen’s appearance?**

Schistosity is “an alignment of visible platy minerals and/or long prismatic crystals” (HOL Lab, 2020). Foliated metamorphic crocks exhibit schistosity; schistosity is one of the four types of foliation (HOL Lab, 2020). Schists exhibit Schistosity. The process of recrystallization associated with regional metamorphism is responsible for the specimen’s appearance (HOL Lab, 2020).

# Conclusions

In this lab, we focused on the characteristics and identities of metamorphic rocks. Beginning with what is called the protolith, the protolith is the parent rock that metaphoric rock is formed from when given extreme heat and pressure. Contact metamorphism and regional metamorphism are the two main processes to create metamorphic rock. In this lab, I looked into identify the product of such metamorphisms -- foliation or lack of foliation. As described in the lab questions, foliated rocks often have a pattern while non-foliated rocks do not. This big feature is how metamorphic rocks are initially sorted. From there we as academic geologists look at whether it is metallic or dull and how visible the grains are. These all put together yield a metaphoric rock specimen name. In this lab, I looked more in depth with the types of foliation and what each type looks like. I enjoyed being able to categorically label the types of rocks I was observing.

# References

Physical Science Department. (2020, Summer). GEY111 HOL lab manual.  Colorado: CCCOnline.  Retrieved from class website at:

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