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Mineral & Rock Identification Lab

Materials:

* Earth science textbook
* Lab investigator: Rocks and Minerals virtual tool
* Computer

Introduction:

Using the rocks and minerals virtual tour, we will be able to identify ten unique mineral samples by looking at the specimen’s color, luster, texture and crystal shape and other properties. We will identify ten unique rock samples by looking at the specimen’s overall color, composition, and texture.

Procedures:

1. In the virtual tool select 10 mineral samples and examine each mineral specimen using the magnifying glass and the 3D rotate tool and record the color, luster, texture, and crystal shape and record results in the table below.
2. In the virtual tool, watch videos for each mineral that tests for streak, cleavage/fracture, mass and specific gravity and record the results in the data table below.
3. Watch videos that test other properties such as magnetism double refraction, and reaction to HCL and record the results in the table below.
4. Once you have finished the mineral specimens, select 10 rock samples and examine each rock specimen using the magnifying glass and the 3D rotate tool and record the rocks color and texture in the table below.
5. In the virtual tool, watch videos for each rock that tests for magnetism, float/sink, mass, and reaction to HCL and record the results in the data table below.

Mineral data table:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mineral | Color | Luster | Streak | Relative  Hardness | Cleavage/  Fracture | Density:  Mass | V1 | V2 | D  g/cm3 | Other  Properties |
| 1 Hematite | Reddish brown to black | Very sparkly | Thick dark streak | 5.5 to 6.5 | Fractures into little pieces | 25.4 g | 150ml | 154.8ml | 5.26 | Non-reactive to HCL, weakly magnetic |
| 2 Halite | Clear white | Glasslike | Thin white streak | 2.5 | Cleaves in three directions | 19.8 g | 150ml | 159ml | 2.16 | Dissolves in water and HCL, not magnetic |
| 3 Talc | White, gray | pearly | Thick white streak | 1 | Cleaves in one direction | 16.1 g | 150ml | 156ml | 2.75 | Feels greasy, non-reactive to HCL |
| 4 Pyrite | golden | Very shiny | Greenish black streak | 6 to 6.5 | Fractures into cubes | 22.35 g | 150ml | 154ml | 5.02 | Non-reactive to HCL, cubic crystals |
| 5 Olivine | Greenish yellow | glassy | Very faint streak | 6.5 to 7 | Fractures into little pieces | 26.1 g | 150ml | 159ml | 3.82 | Non-reactive to HCL, granular texture |
| 6 Calcite | White or colorless | Glass like | Thick sparkly streak | 3 | Cleaves in three directions | 14.7 g | 150ml | 155ml | 2.71 | Very reactive with HCL, double refraction |
| 7 Fluorite | Colorless, purple | glassy | Faint light streak | 4 | Perfect cleaves in three directions | 33.8 g | 150ml | 160ml | 3.18 | Non-reactive to HCL, nice crystals |
| 8  Magnetite | black | metallic | Black streak | 6 | Fractures unevenly | 34.6 g | 150ml | 162ml | 5.18 | Strongly magnetic, non-reactive to HCL |
| 9 Gypsum | Gray or white | Pearly | Thick white streak | 2 | Cleaves in three directions | 21.1 g | 150ml | 169ml | 2.32 | Not magnetic and not reactive to HCL |
| 10 muscovite | Dark green to black | pearly | Thin sparkly streak | 2.5 to 3 | Perfect cleaves in one direction | 15.6 g | 150ml | 156ml | 3.00 | Not magnetic and not reactive to HCL |

Rock data table:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rock | Overall Color | Composition | Texture | Sketch | Rock Type | Rock Name |
| 1 | Black | glassy | Smooth and sharp | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\obsidian.jpg | igneous | Obsidian |
| 2 | White to yellow | Frothy glass | Rough and full of tiny little holes everywhere | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\pumice.jpg | igneous | Pumice |
| 3 | White, green, and black with dramatic swirl pattern | Interlocking calcite or dolomite grains | Medium to coarse nonfoliated | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\dolomite-marble-image.jpg | Metamorphic | Marble |
| 4 | White, green, and black with dramatic banded pattern | Banding of minerals | Medium to coarse foliated | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\gniess.jpg | Metamorphic | Gneiss |
| 5 | black | Altered plant fragments | Fine grained organic matter | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Bituminous-coal.jpg | sedimentary | Bituminous coal |
| 6 | Brown or gray | mud | Very fine grain | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\shale.jpg | sedimentary | Shale |
| 7 | Dark gray or black | Calcium rich plagioclase feldspar | Fine grained | C:\Users\ian\AppData\Local\Microsoft\Windows\INetCache\Content.Word\basalt.jpg | igneous | basalt |
| 8 | White to yellow | calcite | Fine to course crystalline | C:\Users\ian\Downloads\limestone.jpg | sedimentary | limestone |
| 9 | black | Shiny black organic rock that fractures | fine | C:\Users\ian\Downloads\anthracite.jpg | metamorphic | anthracite |
| 10 | Multi-colors often brown and reddish | mixture of hydrous aluminum oxides, aluminum hydroxides, clay minerals, and insoluble materials | Coarse ore | C:\Users\ian\Downloads\bauxite.jpg | sedimentary | bauxite |

Conclusions:

In doing this mineral and rock identification lab, I found that for the mineral portion that the properties of color and luster were most useful and testing for HCL reactivity was least useful. The minerals with metallic luster were denser and often were somewhat magnetic. When identifying the rock specimens, I found the characteristics of texture and composition to be the most useful and color to be the least useful because most of the rocks were either white or black. I thought it was easier to identify the minerals even though there were fewer choices with the rocks. During the metamorphic process of heat and pressure limestone is turned to marble and bituminous coal is turned to anthracite. In the rock cycle, any rock can be turned into something else through metamorphism. In the case of the two pair I mentioned above both started as sedimentary rocks. By using the rocks and minerals virtual tour, I could identify ten unique mineral samples by looking at the specimen’s color, luster, texture and crystal shape and other properties and identify ten unique rock samples by looking at the specimen’s overall color, composition, and texture.