

## Re: Extra Credit Opportunity for Physical Geology Lab - Minerals

Whitman, Sydney Zallen <whitmans3@mailbox.winthrop.edu>

Mon 9/5/2016 4:55 PM

To: Quarles, William A. <quarlesw@winthrop.edu>

1. According to Mohs scale of hardness, quartz has a hardness of 7, while calcite has a hardness of 3. To tell the two apart, try scratching one on the other. If you take one rock and it cannot make a scratch on the second, then the first rock is calcite.
2. Though they are both framework silicates, feldspar and quartz differ because feldspars contain aluminum, which substitutes for silicon in the tetrahedra, as well as calcium, sodium and potassium. Quartz on the other hand contains only silicon and oxygen.
3. One can tell the difference between muscovite and biotite because muscovite is more stable than biotite, and it also weathers slower.
4. Tendency to split along planes of weakness corresponding to weaker chemical links in internal structure of crystal. A single crystal can display several cleavage directions. The cleavage directions are not always at right angles to each other. They also are not necessarily parallel to the crystal face.
5. You cannot depend on color for identifying minerals because doping agents can be added to minerals in order to change their color. As well, minerals can appear to be different colors under different types of lighting.
6. The eight major igneous rock forming silicate minerals are olivine, pyroxene, amphibole, biotite, K-Feldspar, muscovite, quartz and plagioclase.

On Sat, Sep 3, 2016 at 9:01 AM, Quarles, William A. <quarlesw@winthrop.edu> wrote:

For up to 2 points (20% of 10 points, so it is not insignificant), reply to this email (be sure you reply only to me) with **your** answers to the following questions, **before** 5:30 P.M., Wednesday, September 7 (next lab, but for both Monday and Wednesday labs).

Do your own work on this, that is, do not just cut and paste from an internet/digital source or from the digital version of the manual. Do not share or discuss with others, or blind copy your email to others. This is for you to learn and benefit from, not to help someone else's grades. We can do that during lab.

For full credit, your answers must be in the form of a complete sentence with correct grammar, spelling, and punctuation, except for #6 which you can just list.

I will email my answers to the group sometime between 5:31 and 6:00 P.M. on the due date, or present them during lab.

Al Quarles

1. What is the best way to tell the difference between quartz and calcite? explain
2. What is the best way to tell the difference between quartz and feldspar? explain
3. What is the best way to tell the difference between muscovite and biotite? explain
4. Describe mineral cleavage.
5. Why is color not an ideal property to use for identifying silicate minerals?
6. Name the eight major igneous rock-forming silicate minerals (hint, see the Bowen's Reaction Series).