GEOLOGY 12
CHAPTER 2
LAB EXERCISE TWO
FOLLOW-UP QUESTIONS

Name Key

Answer the following questions on a separate piece of paper.

1. If you found an unknown mineral, what procedure would you follow to identify it? colour, lustre, streak, hardness... narrow down, use data sheet
2. If a mineral has no streak, is it metallic? Explain. NO
3. Can a nonmetallic mineral have a streak? Explain. yes
4. Will a quartz crystal scratch glass? yes diamond? no your fingernail? yes
5. Will calcite scratch glass? no gypsum? yes your fingernail? yes
6. Will biotite scratch muscovite? yes Explain. 2.5 - 2.5
7. What mineral was used to make your favorite glass beverage mug? quartz
8. What mineral was used to make your favorite ceramic beverage mug? feldspar
9. The minerals calcite, halite, and gypsum are nonmetallic, light, softer than glass, and have three directions of cleavage.
   a. Give two ways calcite differs from halite. calcite fizzes, double refracts
   b. Give two ways halite differs from gypsum. halite tastes salty, is cubic
   c. Give two ways calcite differs from gypsum. rhombohedral, fizzes
   d. What is the economic significance (use) of calcite? cement, lime
   e. What is the economic significance (use) of halite? salt - food, roads
   f. What is the economic significance (use) of gypsum? wall board, cement
10. What products in your house might be made from these minerals?
    a. mica electronic insulators, paint
    b. gypsum walls
    c. hematite, magnetite or limonite - cars, flatware, machinery
    d. graphite pencils, dry lubricant
    e. galena batteries, protective coatings in planes, tv, dentist
    f. feldspar glass, ceramics, fertilizer

good website: www.rocksandminerals.com/uses.htm

11. You are given three minerals: a dark plagioclase feldspar, pyroxene (augite), and amphibole (hornblende).
    a. List four physical properties these minerals have in common. - lustre - streak - hardness = 6 - density ≈ 3 - dark colour
    b. What property best distinguishes amphibole from pyroxene and the plagioclase feldspar? cleavage
    c. What property best distinguishes pyroxene from the plagioclase feldspar?
12. You are given a specimen of orthoclase (K) feldspar and one of light plagioclase (Na/Ca) feldspar.
    a. List four physical properties these two minerals have in common. - streak - cleavage - hardness, density
    b. List one physical property that can be used to best distinguish orthoclase from plagioclase. maybe colour, maybe lustre, maybe form.

streak - white-grey - white

use data pages

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GEOLOGY 12
CHAPTER 2 WORKSHEET
MINERALS AND ROCKS

Name Key

1. An atom is the smallest particle into which an element can be subdivided and still retain its distinctive chemical characteristics.

2. Atoms of the same element which have different atomic mass numbers are known as isotopes.

3. A positively charged atom is called a(n) ion cation

4. A negatively charged atom is called a(n) ion anion

5. In a covalent chemical bond, atoms share electrons.

6. Synthetic gemstones are not true minerals because they are not naturally occurring.

7. When a mineral composition includes elements in a compositional range (or solid solution), those elements can interchange in the mineral's structure because the elements have a similar size and charge.

8. In order for crystals of a given mineral to form, there must be time for the atoms to arrange themselves into a(n) regular internal structure.

9. A glass may be described as a solid which cools so rapidly from a liquid that the atoms remain randomly arranged in a noncrystalline form.

10. The two fundamental characteristics of a mineral which will distinguish it from all other minerals are its composition and its internal structure.

11. Diamond and graphite, which have the same composition but very different crystal structures, are examples of polymorphs.

12. Hardness is the ability of a mineral to resist scratching.

13. The tendency of a mineral to break preferentially along planes of weakness is called cleavage.

14. Gold can easily be distinguished from pyrite on the basis of its specific gravity, another physical property of minerals

15. Streak, the color of the powdered mineral, is more consistent that the color of a bulk mineral.

16. The largest mineral group in the earth's crust is the silicates group.

17. Pyroxenes and amphiboles are two types of chain silicates, in which silica tetrahedra share oxygen atoms in only one dimension.

Key

18. The micas and clay minerals are types of sheet silicates, in which silica tetrahedra share oxygen atoms in two dimensions.

19. Biotite, a mica, has excellent cleavage in one plane because of its crystal structure.

20. Quartz has a(n) framework structure, where there are no planes of weaker bonds in the mineral; as a result, quartz lacks cleavage and will fracture when broken.

21. Silicate minerals which are rich in iron and magnesium are termed ferromagnesian silicates.

22. The most important and abundant carbonate mineral is calcite.

23. The mineral pyrite, or "fool's gold", is a familiar sulphide mineral.

24. Sapphires and rubies are gemstone varieties of the aluminum oxide mineral, Corundum.

25. Gold, silver, and copper are all examples of native elements, or minerals which exists as single chemical elements.

26. The atomic number of an element is equal to the number of
   (A.) protons in the nucleus
   B. neutrons in the nucleus
   C. electrons swirling around the nucleus
   D. protons plus neutrons in the nucleus

27. In a neutrally charged atom, which of the following situations would be true?
   A. the number of electrons is greater than the number of neutrons
   (B.) the number of electrons is equal to the number of protons
   C. the number of protons is equal to the number of neutrons
   D. the number of neutrons is greater than the sum of the electrons and protons

28. Which of the following is NOT an example of a mineral?
   A. halite (B.) sugar C. quartz D. diamond

29. Which mineral below could attract metal objects to itself?
   A. hematite B. pyrite C. olivine (D.) magnetite

30. Which pair of common mineral-forming elements below is most likely to be found in solid solution in a mineral composition?
   A. graphite and diamond ×
   (B.) magnesium (Mg^{2+}) and (Fe^{2+}) – same size and charge
   C. oxygen (0^{2-}) and calcium (Ca^{2+}) ~~small~~
   D. potassium (K^{1+}) and sodium (Na^{1+}) small