

Physical Geology 16th edition Plummer Test Bank

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Physical Geology, 16e (Plummer)
Chapter 2 Atoms, Elements, and Minerals

1) A mineral is defined as a crystalline solid that is naturally occurring, has a specific chemical composition, and forms through geologic processes.

Answer: TRUE
Topic: Earth Materials
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

2) The innermost energy level in the standard model of an atom is full when it possesses eight electrons.

Answer: FALSE
Topic: Earth Materials
Bloom's: 2. Understand
Accessibility: Keyboard Navigation
Chapter: 02

3) The atomic mass number is equal to the number of neutrons in an atom.

Answer: FALSE
Topic: Earth Materials
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

4) The atomic number of an element is equal to the number of protons in each atom.

Answer: TRUE
Topic: Earth Materials
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

5) Rocks are defined as naturally-formed aggregates of minerals or mineral-like substances.

Answer: TRUE
Topic: Earth Materials
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

6) The number of neutrons in an atom controls the chemical behavior of an element.

Answer: FALSE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

7) *Silica* is a term for oxygen combined with silicon.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

8) It is clear that exposure to white asbestos causes cancer among non-smoking asbestos workers.

Answer: FALSE

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

9) Both graphite and diamond are made of carbon.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

10) All of the most common rock-forming minerals in Earth's crust are silicate minerals.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

11) Clay minerals are very common in the Earth's upper mantle.

Answer: FALSE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

12) Calcite (calcium carbonate) is the most common non-silicate mineral in the Earth's crust.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

13) Non-silicate minerals are more abundant in the deeper parts of Earth's crust than in the crust as a whole.

Answer: FALSE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

14) The quality and intensity of light that is reflected from the surface of a mineral is termed luster.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

15) A mineral specimen with a Mohs hardness of 5 can scratch a mineral specimen with a hardness of 3.

Answer: TRUE

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

16) Minerals that have the same chemical composition but have different crystalline structures exhibit polymorphism.

Answer: TRUE

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

17) Color is the least reliable physical property in mineral identification.

Answer: TRUE

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

18) Diamond has no cleavage.

Answer: FALSE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

19) Specific gravity is the ratio of a mass of a substance to the mass of an equal volume of air.

Answer: FALSE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

20) The crystal form of a mineral is a set of faces that have a definite geometric relationship to one another.

Answer: TRUE

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

- 21) In order for a particular type of material to be classified as a mineral, it must _____.
A) be a solid
B) occur naturally
C) have a crystalline structure
D) have a definite chemical composition
E) All of the answers are correct.

Answer: E

Topic: Earth Materials

Bloom's: 2. Understand

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Chapter: 02

- 22) The atomic number of an element equals the number of _____ in each atom.
A) electrons
B) neutrons
C) protons
D) Answers neutrons and protons are both correct; answer electrons is not correct.
E) Answers electrons, neutrons and protons are all correct.

Answer: C

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

- 23) The atomic mass number of an atom is the total number of _____ in the atom.
A) electrons
B) neutrons
C) protons
D) protons and neutrons
E) protons, neutrons, and electrons

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

24) _____ of an element are atoms containing different numbers of neutrons but the same number of protons.

- A) Ions
- B) Classes
- C) Particles
- D) Isotopes
- E) Varieties

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

25) The atomic mass number of common oxygen is 16 because it has _____ protons and _____ neutrons.

- A) 7; 9
- B) 8; 8
- C) 9; 7
- D) 5; 11
- E) 10; 6

Answer: B

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

26) Carbon-14 has eight _____.

- A) protons
- B) nuclei
- C) neutrons
- D) isotopes
- E) atoms

Answer: C

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

27) The isotope composition of _____ in foraminifera shells from sediment cores are used to determine climate change in Earth history.

- A) oxygen
- B) carbon
- C) uranium
- D) lead
- E) helium

Answer: A

Topic: Earth Materials; Climate, Weather, and Their Influences on Geology

Bloom's: 1. Remember

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Chapter: 02

28) The two most abundant elements in Earth's crust are _____.

- A) iron and magnesium
- B) carbon and hydrogen
- C) carbon and oxygen
- D) hydrogen and oxygen
- E) oxygen and silicon

Answer: E

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

29) When seawater evaporates, its sodium and chlorine are electronically attracted to one another and crystallize into _____.

- A) quartz
- B) halite
- C) clay
- D) calcite
- E) hematite

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

30) The mineral _____ reacts with weak hydrochloric acid to produce carbon dioxide gas, i.e., it effervesces (fizzes) in dilute acid.

- A) calcite
- B) feldspar
- C) quartz
- D) biotite
- E) amphibole

Answer: A

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

31) The _____ group and the _____ group are sheet silicates characterized by one direction of cleavage.

- A) amphibole; pyroxene
- B) feldspar; quartz
- C) olivine; plagioclase
- D) mica; clay
- E) carbonate; sulfide

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

32) Two examples of framework silicates are _____ and _____.

- A) calcite; dolomite
- B) olivine; pyroxene
- C) quartz; feldspar
- D) biotite; muscovite
- E) amphibole; olivine

Answer: C

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

33) _____ is the ability of a mineral to break, when struck or split, along preferred planar directions.

- A) Cleavage
- B) Crystal form
- C) Facets
- D) Planes
- E) Form

Answer: A

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

34) A silica tetrahedron is composed of four atoms of the element _____ and one atom of _____.

- A) silicon; aluminum
- B) silicon; oxygen
- C) silicon; iron
- D) oxygen; silicon
- E) aluminum; silicon

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

35) The common mineral _____ is an example of an isolated silica tetrahedron structure.

- A) amphibole
- B) feldspar
- C) olivine
- D) pyroxene
- E) mica (biotite, muscovite, etc.)

Answer: C

Topic: Earth Materials

Bloom's: 2. Understand

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Chapter: 02

36) Five of the six minerals collectively known as asbestos contain single chains of silica tetrahedral and belong to the _____.

- A) amphiboles
- B) feldspars
- C) olivines
- D) pyroxenes
- E) micas

Answer: D

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

37) The _____ group of minerals is characterized by two parallel chains of silica tetrahedra in their structure.

- A) amphibole
- B) feldspar
- C) olivine
- D) pyroxene
- E) mica (biotite, muscovite, etc.)

Answer: A

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

38) The _____ group of minerals are sheet silicates.

- A) amphibole
- B) feldspar
- C) olivine
- D) pyroxene
- E) mica

Answer: E

Topic: Earth Materials

Bloom's: 1. Remember

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Chapter: 02

39) Non-silicate minerals include the halides such as _____.

- A) calcite
- B) halite
- C) magnetite
- D) pyrite
- E) gypsum

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

40) The mineral _____ is an example of a native element.

- A) quartz
- B) feldspar
- C) calcite
- D) graphite
- E) halite

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

41) A pulverized mineral (usually on a piece of white unglazed porcelain) gives a color called its _____, that is usually more reliable than the color of the specimen itself.

- A) dust
- B) chroma
- C) streak
- D) smear
- E) powder

Answer: C

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

42) The softest mineral on Mohs' hardness scale is _____.

- A) gypsum
- B) talc
- C) diamond
- D) quartz
- E) mica

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

43) What is the special property of the mineral halite?

- A) It has 5 directions of cleavage.
- B) It has a hardness of -3.
- C) It can transmit electricity.
- D) It tastes like salt.
- E) It has an extremely high melting temperature.

Answer: D

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

44) _____ has the property of generating electricity when squeezed in a certain crystallographic direction.

- A) Copper
- B) Mica
- C) Amphibole
- D) Gold
- E) Quartz

Answer: E

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

45) The hardest mineral has a hardness of _____ on Mohs' relative hardness scale.

- A) 1
- B) 10
- C) 100
- D) 1000
- E) 10000

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

46) Calcite has _____ directions of cleavage.

- A) 1
- B) 2
- C) 3
- D) 4
- E) 6

Answer: C

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

47) In some minerals the bonds are equally strong in all directions, therefore they have no cleavage but instead _____ along irregular surfaces that are commonly curved.

- A) luminesce
- B) chip
- C) flatten
- D) bend
- E) fracture

Answer: E

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

48) The third most abundant element in the Earth's crust is _____; it is more common than iron.

- A) magnesium
- B) aluminum
- C) calcium
- D) fluorine
- E) tin

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

49) The mineral _____ is strongly magnetic.

- A) calcite
- B) pyrite
- C) magnetite
- D) magnesite
- E) quartz

Answer: C

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

50) _____ and sapphire are both varieties of the common mineral corundum.

- A) Emerald
- B) Turquoise
- C) Ruby
- D) Beryl
- E) Peridot

Answer: C

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

51) _____ is an expansive (swells when wet) clay mineral.

- A) Quartz
- B) Olivine
- C) Pyroxene
- D) Montmorillonite
- E) Mica

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

52) _____ is the most common element in the Earth's crust.

- A) Oxygen
- B) Iron
- C) Magnesium
- D) Hydrogen
- E) Fluorine

Answer: A

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

53) Some minerals have the same chemical composition but different crystal structures, a phenomenon termed _____.

- A) alteration
- B) recrystallization
- C) metamorphism
- D) isotopes
- E) polymorphism

Answer: E

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

54) _____, a Danish naturalist, was the first to note that the angle between two adjacent faces of a crystal of quartz is always exactly the same.

- A) Einstein
- B) Steno
- C) Plummer
- D) McGeary
- E) Carlson

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

55) Specific gravity is the ratio of the mass of a mineral to the mass of an equal volume of _____.

- A) liquid water
- B) solid water
- C) quartz
- D) diamond
- E) air

Answer: A

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

56) Plagioclase feldspar commonly exhibits _____, straight, parallel lines on the flat surfaces of one of the two cleavage directions.

- A) parallelograms
- B) grooves
- C) laminations
- D) striations

Answer: D

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

57) _____ elements make up 98% of the Earth's crust.

- A) Fourteen
- B) Ninety-two
- C) Two
- D) Twenty
- E) Eight

Answer: E

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

58) _____ are the smallest electrically neutral assemblies of matter and energy that we know of in the universe.

- A) Isotopes
- B) Atoms
- C) Ions
- D) Electrons
- E) Protons

Answer: B

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

59) The most common minerals in the Earth's crust are the _____.

- A) silicates
- B) carbonates
- C) halides
- D) sulfides
- E) sulfates

Answer: A

Topic: Earth Materials

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

60) On Mohs' scale of hardness your fingernail has a value of _____.

- A) 12
- B) 5
- C) $2\frac{1}{2}$
- D) $6\frac{1}{2}$
- E) 9

Answer: C

Topic: Earth Materials

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

61) Which of the following substances is the only mineral listed?

- A) clam shell
- B) bone
- C) ice
- D) water
- E) synthetic diamond

Answer: C

Topic: Rocks

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

62) Radioactive isotopes are particularly important to geologists as we use them _____.

- A) to find fossils
- B) to find petroleum deposits
- C) as a proxy for ancient sea temperatures
- D) to determine the numeric ages of rocks
- E) for power generation in remote field stations

Answer: D

Topic: Rocks

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

63) Electrons move freely through the crystal structures of gold and silver in _____ bonding.
A) metallic
B) ionic
C) covalent

Answer: A
Topic: Rocks
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

64) To obtain a more stable configuration, atoms may share electrons in their outer energy level in _____ bonding.
A) metallic
B) ionic
C) covalent

Answer: C
Topic: Rocks
Bloom's: 1. Remember
Accessibility: Keyboard Navigation
Chapter: 02

65) Both graphite and diamond are made entirely of carbon, yet they have very different physical characteristics because _____.
A) they are made of different carbon isotopes
B) of the type of bonding between the carbon atoms
C) graphite is created in a cool setting and diamond is a hot setting
D) diamond's carbon atoms are larger than graphite's

Answer: B
Topic: Rocks
Bloom's: 2. Understand
Accessibility: Keyboard Navigation
Chapter: 02

66) A mineral with CO₃ in its formula is a(n) _____.

- A) halide
- B) oxide
- C) sulfide
- D) carbonate
- E) chloride

Answer: D

Topic: Rocks

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

67) Mineral crystals may exhibit _____ with a specific cation in the center and a different cation on its rim.

- A) compositional zoning
- B) polymorphism
- C) double refraction
- D) cleavage

Answer: A

Topic: Rocks

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

68) Calcite is one of the minerals that exhibits _____ when a ray of light is split into two components as it travels through a crystal.

- A) compositional zoning
- B) polymorphism
- C) double refraction
- D) cleavage
- E) striations

Answer: C

Topic: Rocks

Bloom's: 1. Remember

Accessibility: Keyboard Navigation

Chapter: 02

- 69) We can use X-rays to determine the internal structure of a mineral, and thereby _____.
A) identify the mineral.
B) change the mineral's structure.
C) change the mineral's composition.
D) destroy the mineral.
E) shrink the mineral.

Answer: A

Topic: Rocks

Bloom's: 2. Understand

Accessibility: Keyboard Navigation

Chapter: 02

- 70) A substance that cannot be broken down into other substances by ordinary chemical methods is a(n)
A) crystal
B) element
C) molecule
D) compound

Answer: B

Section: 02.02 Atoms and Elements

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

- 71) The subatomic particle that contributes mass and a single positive electrical charge is the
A) proton
B) neutron
C) electron

Answer: A

Section: 02.02 Atoms and Elements

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

72) Atoms of an element containing different numbers of neutrons but the same number of protons are called

- A) compounds
- B) ions
- C) covalent
- D) isotopes

Answer: D

Section: 02.02 Atoms and Elements

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

73) Atoms with either a positive or negative charge are called

- A) compounds
- B) ions
- C) elements
- D) isotopes

Answer: B

Section: 02.02 Atoms and Elements

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

74) The bonding between Cl and Na in halite (table salt) is

- A) ionic
- B) covalent
- C) metallic
- D) male

Answer: A

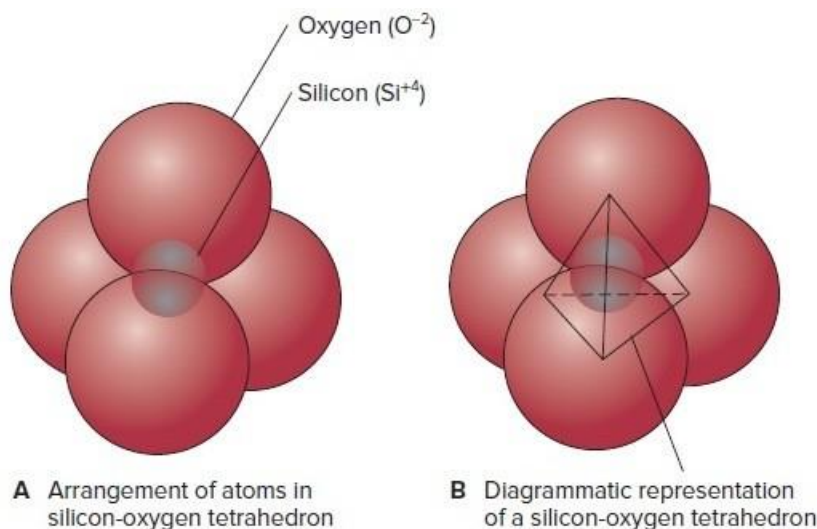
Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Accessibility: Keyboard Navigation

Chapter: 02

75) Which is *not* true of a single silicon-oxygen tetrahedron?



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- A) The atoms of the tetrahedron are strongly bonded together.
- B) It has a net negative charge.
- C) The formula is SiO_4 .
- D) It has four silicon atoms.

Answer: D

Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Accessibility: Keyboard Navigation

Chapter: 02

76) Which is *not* a type of silicate structure?

- A) isolated
- B) single chain
- C) double chain
- D) sheet
- E) framework
- F) pentagonal

Answer: F

Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Accessibility: Keyboard Navigation

Chapter: 02

77) Which of these common minerals is *not* a silicate?

- A) quartz
- B) calcite
- C) pyroxene
- D) feldspar
- E) biotite

Answer: B

Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Accessibility: Keyboard Navigation

Chapter: 02

78) On Mohs' hardness scale, ordinary window glass has a hardness of about

- A) 2–3
- B) 3–4
- C) 5–6
- D) 7–8

Answer: C

Section: 02.04 The Physical Properties of Minerals

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

79) The ability of a mineral to break along preferred directions is called

- A) fracture
- B) crystal form
- C) hardness
- D) cleavage

Answer: D

Section: 02.04 The Physical Properties of Minerals

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

80) Striations are associated with

- A) quartz
- B) mica
- C) potassium feldspar
- D) plagioclase

Answer: D

Section: 02.04 The Physical Properties of Minerals

Topic: Rocks

Accessibility: Keyboard Navigation

Chapter: 02

81) Crystalline substances are always

- A) ionically bonded
- B) minerals
- C) made of repeating patterns of atoms
- D) made of glass

Answer: C

Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Accessibility: Keyboard Navigation

Chapter: 02

82) The mineral kaolinite is a(n)

- A) sheet silicate
- B) chain silicate
- C) framework silicate
- D) oxide

Answer: A

Section: 02.03 Variations in Mineral Structures and Compositions

Topic: Rocks; Mineral Resources

Bloom's: 3. Apply

Accessibility: Keyboard Navigation

Chapter: 02