POWER BASICS PLUS

Chemistry

Test Pack

WALCH PUBLISHING

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CHEMISTRY • PRETEST

Circle the correct answer to each of the following questions.

1. Which of the following is NOT an example of matter?
   a. air
   b. asteroids
   c. gravity
   d. water

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2. Which of the following is a substance?
   a. air
   b. brass
   c. gold
   d. tap water

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3. What is a homogeneous mixture?
   a. a mixture in which one substance makes up more than 90 percent of the mixture
   b. a mixture in which substances are unevenly divided
   c. a mixture with visible boundaries between substances
   d. a solution

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4. Which of the following is least likely to go into solution in pure water?
   a. corn starch
   b. salt
   c. sugar
   d. baking soda

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5. Which of the following has a fixed volume, but not a fixed shape?
   a. a gas
   b. a liquid
   c. a solid
   d. a vapor

UNIT 2 TEST • PROPERTIES OF MATTER

Circle the correct answer to each of the following questions.

1. The atomic number of an atom of lithium is 3, and its mass number is 7. How many neutrons does this atom contain?
   a. three
   b. four
   c. seven
   d. ten

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2. Which of the following is NOT a subatomic particle?
   a. an electron
   b. an ion
   c. a neutron
   d. a proton

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3. In what way do the various isotopes of the same element differ?
   a. They have different atomic numbers.
   b. They have different mass numbers.
   c. They have different numbers of electrons.
   d. They have different numbers of protons.

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4. Under what circumstances do the elements of Group 2 of the periodic table form stable ionic compounds?
   a. when they appear as anions with a –1 charge
   b. when they appear as anions with a –2 charge
   c. when they appear as cations with a +1 charge
   d. when they appear as cations with a +2 charge

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5. What does it mean to say that the natural abundance of ^{48}Ti is 5.5 percent?
   a. In a naturally occurring sample of titanium, ^{48}Ti will account for 5.5 percent of the sample.
   b. In a naturally occurring sample of titanium, ^{48}Ti will account for 48 percent of the sample 5.5 percent of the time.
   c. In nature, ^{48}Ti is only 5.5 percent pure.
   d. In nature, ^{48}Ti is 5.5 percent heavier than the other isotopes of titanium.

6. Z = 1 for hydrogen; Z = 2 for helium; Z = 3 for lithium. What is Z?
   a. the atomic number
   b. the mass number
   c. the number of neutrons in each
   d. the relative abundance of the elements in nature

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7. How is the modern periodic table of the elements organized?
   a. by atomic number
   b. by mass number
   c. by melting point
   d. by physical state at room temperature (20°C)

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8. Which parts of the periodic table are called periods?
   a. the horizontal rows
   b. the lanthanides
   c. the transition elements
   d. the vertical columns

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9. Which group of the periodic table is known for being highly unreactive?
   a. group 1
   b. group 6
   c. group 9
   d. group 18

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10. Which of the following elements is the least reactive?
    a. lithium
    b. magnesium
    c. neon
    d. sodium

11. Which of the following is NOT a metalloid?

- **a.** arsenic (As)
- **b.** boron (B)
- **c.** silicon (Si)
- **d.** sodium (Na)

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12. In the formula MOH, what does M stand for?

- **a.** any alkali metal
- **b.** any alkaline earth metal
- **c.** any halogen
- **d.** any noble gas

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13. What happens when an element becomes a cation?

- **a.** Electrons are held tighter and closer to the nucleus.
- **b.** It gains an electron.
- **c.** Its atomic mass increases.
- **d.** Its atomic radius increases.

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14. Which is true of a cation?

- **a.** It is attracted to an anode during electrolysis.
- **b.** It is a free radical.
- **c.** It is a positively charged ion.
- **d.** It is a negatively charged ion.

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15. Which is true of an anion?

- **a.** It is a negatively charged ion.
- **b.** It is attracted to a cathode.
- **c.** It is held tightly by the nucleus of an atom.
- **d.** It is unreactive.

16. Which of the following may be highly stable?

- **a.** a large collection of anions
- **b.** a large collection of cations
- **c.** a large collection of both anions and cations
- **d.** Anions and cations are never stable, under any conditions.

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17. Which of the following is a diatomic homonuclear molecule?

- **a.** Br_2
- **b.** CO_2
- **c.** HCl
- **d.** HF

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18. The molecular formula for caffeine is $C_8H_{10}N_4O_2$. What is its empirical formula?

- **a.** CHNO
- **b.** $C_4H_5N_2O$
- **c.** $C_6H_8N_2O$
- **d.** $C_8H_{10}N_4O_2$

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19. When there is a double bond between two atoms, how many electrons do they share?

- **a.** two
- **b.** four
- **c.** six
- **d.** eight

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20. The atomic mass of boron is 10.81 amu. What will be the mass of 1 mole of boron atoms?

- **a.** 1.081 grams
- **b.** 10.81 grams
- **c.** 108.1 grams
- **d.** 1.081 kilograms

21. Which of the following is NOT the result of a reaction between a Group 1 element and a halogen?

a. CsCl

b. CsF

c. LiCl

d. Li_2O

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22. What happens when the outer shell of an element is completely filled with electrons?

a. The element is highly reactive.

b. The element is moderately reactive.

c. The element is slightly reactive.

d. The element is highly unreactive.

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23. Lithium has three protons and one valence electron. What is the effective nuclear charge on this electron?

a. +1

b. +2

c. +3

d. +4

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24. How big is the radius of a cation compared to the corresponding neutral atom?

a. The radius of the cation is smaller.

b. The radius of the cation is unchanged.

c. The radius of the cation is somewhat larger.

d. The radius of the cation is much larger.

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25. When sodium reacts with chlorine to form table salt (NaCl), how big is the radius of the sodium ion compared to the radius of the sodium atom?

a. smaller

b. the same

c. somewhat larger

d. much larger

Circle the correct answer to each of the following questions.

1. Which of the following is the first step in the scientific method?
   a. conducting an experiment
   b. defining a problem
   c. developing a theory
   d. gathering information

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2. Which of the following is a mixture?
   a. air
   b. gold
   c. oxygen
   d. pure water

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3. You brew a pot of coffee. Chemically, what have you made?
   a. a solution
   b. a suspension
   c. a chemical reaction
   d. a solute

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4. You have washed your kitchen floor with a liquid cleaner. Chemically, what is the cleaner?
   a. a solution
   b. a suspension
   c. a solvent
   d. a solute

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5. Which of the following is a compound?
   a. copper
   b. helium
   c. nitrogen
   d. table salt