

Matter – Cut from Jan 2007 – Jan 2008 Exams

(2) an isotope (4) a solution

1. A sample composed only of atoms having the same atomic number is classified as

- (1) a compound (3) an element
(2) a solution (4) an isomer

2. A dilute, aqueous potassium nitrate solution is best classified as a

- (1) homogeneous compound
(2) homogeneous mixture
(3) heterogeneous compound
(4) heterogeneous mixture

3. At which Celsius temperature does lead change from a solid to a liquid?

- (1) 874°C (3) 328°C
(2) 601°C (4) 0°C

4. Which statement describes a chemical property of hydrogen gas?

- (1) Hydrogen gas burns in air.
(2) Hydrogen gas is colorless.
(3) Hydrogen gas has a density of 0.000 09 g/cm³ at STP.
(4) Hydrogen gas has a boiling point of 20. K at standard pressure.

5. Which element has the greatest density at STP?

- (1) calcium (3) chlorine
(2) carbon (4) copper

6. Which statement describes a chemical property of the element magnesium?

- (1) Magnesium is malleable.
(2) Magnesium conducts electricity.
(3) Magnesium reacts with an acid.
(4) Magnesium has a high boiling point.

7. Matter that is composed of two or more different elements chemically combined in a fixed proportion is classified as

- (1) a compound (3) a mixture

8. Which element is a solid at STP and a good conductor of electricity?

- (1) iodine (3) nickel
(2) mercury (4) sulfur

9. The table below shows mass and volume data for four samples of substances at 298 K and 1 atmosphere.

Masses and Volumes of Four Samples

Sample	Mass (g)	Volume (mL)
A	30.	60.
B	40.	50.
C	45	90.
D	90.	120.

Which two samples could consist of the same substance?

- (1) A and B (3) B and C
(2) A and C (4) C and D

10. Bronze contains 90 to 95 percent copper and 5 to 10 percent tin. Because these percentages can vary, bronze is classified as

- (1) a compound (3) a mixture
(2) an element (4) a substance

11. At STP, which list of elements contains a solid, a liquid, and a gas?

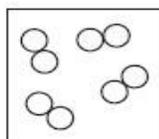
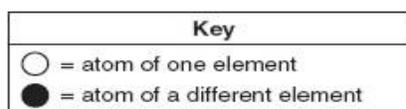
- (1) Hf, Hg, He (3) Ba, Br₂, B
(2) Cr, Cl₂, C (4) Se, Sn, Sr

12. A 10.0-gram sample of which element has the *smallest* volume at STP?

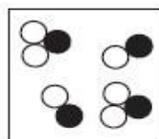
- (1) aluminum (3) titanium
(2) magnesium (4) zinc

13. At room temperature, a mixture of sand and water can be separated by
- (1) ionization
 - (2) combustion
 - (3) filtration
 - (4) sublimation

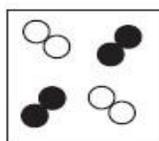
14. Which particle diagram represents a sample of one compound, only?



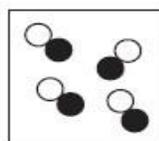
(1)



(3)



(2)



(4)

15. A 1.00-mole sample of neon gas occupies a volume of 24.4 liters at 298 K and 101.3 kilopascals. Calculate the density of this sample. Your response must include *both* a correct numerical setup and the calculated result.

Base your answers to questions 16 through 18 on the information below.

In an investigation, a dripless wax candle is massed and then lighted. As the candle burns, a small amount of liquid wax forms near the flame. After 10 minutes, the candle's flame is extinguished and the candle is allowed to cool. The cooled candle is massed.

16. Identify *one* physical change that takes place in this investigation.

17. State *one* observation that indicates a chemical change has occurred in this investigation.