Test yourself

Chapter 5

1 Which one of the following statements about the states of matter is **false**?

A The molecules in gases are randomly arranged

B In a molecular liquid, the molecules are completely free to move in any direction

C The particles in a molecular solid cannot change position with each other

D The molecules in liquids are close together

2 Which one of the following assumptions about an **ideal** gas is correct?

A The distance between the gas molecules is much greater than the diameter of the molecules

B Kinetic energy is lost when gas molecules collide

C The temperature of a gas does not depend on the average kinetic energy of its molecules

D There are forces of attraction between all gas molecules

3 Which one of the following assumptions about vapour pressure is correct?

A A substance boils when its vapour pressure is below atmospheric pressure

B Vapour pressure is the pressure exerted by a vapour in equilibrium with a solid

C Vapour pressure is the energy required to change 1 mole of liquid to 1 mole of vapour

D Vapour pressure increases with increase in temperature

4 Which one of the following calculations will give the correct numerical value in m^3 for the volume occupied by 0.4 moles of carbon dioxide at a pressure of 170 kPa and a temperature of 27 °C?

A $\dfrac{8.31 \times 300}{0.4 \times 170000}$

B $\dfrac{0.4 \times 170000}{8.31 \times 300}$

C $\dfrac{0.4 \times 8.31 \times 27}{170}$

D $\dfrac{0.4 \times 8.31 \times 300}{170000}$

5 Which one of the following statements about ionic structures is **false**?

A Ionic structures have high melting points because of the strong attractive forces between large numbers of oppositely charged ions

B Ionic structures conduct electricity when molten because the ions are free to move

C It is very difficult to split ionic crystals because of the strong attractive forces between the positive and negative ions

D Magnesium oxide has a higher melting point than sodium chloride because the ions in magnesium oxide have a higher charge density than the ions in sodium chloride

6 Which one of the following statements about ceramics is correct?

A Most ceramics are easily scratched

B The network of covalent bonds in ceramics is broken at high temperatures

C Ceramics act as electrical insulators

D Many ceramics are chemically reactive

7 Which one of the following statements about recycling materials is correct?

A Less energy is needed to recycle copper than is needed to extract it from its ore

B It requires more energy to melt 1 mole of aluminium scrap than to melt 1 mole of aluminium oxide

C There are very few costs involved in recycling steel cans plated with tin

D The copper used for electrical wiring is produced from copper ore rather than from recycled copper because recycled copper has too many impurities

8 Which one of the following statements about the properties of gases is **false**?

A Decreasing the volume of a gas at constant temperature increases its pressure

B The volume of a gas at constant temperature is proportional to its pressure

C The volume of a gas at constant pressure is proportional to its temperature in kelvin

D The volume of a gas under standard conditions is proportional to the number of moles of gas present

9 Which one of the following statements about silicon(IV) oxide is correct?

A Silicon(IV) oxide has a giant ionic structure

B Silicon(IV) oxide forms soft orange-coloured crystals

C Each oxygen atom in silicon(IV) oxide is bonded to two silicon atoms

D Pure silicon(IV) oxide conducts electricity when molten

10 The relative molecular mass of a volatile liquid is found by injecting a known mass of it into a gas syringe and allowing it to vaporise. When 0.375 g of a liquid were vaporised, 52.0 cm^3 of vapour were produced at 100 °C and 200 kPa.

Which one of the following gives the mass of 1 mole of the liquid in grams?
(R = 8.31 $J\,K^{-1}\,mol^{-1}$)

A $\dfrac{0.375 \times 8.31 \times 100}{200000 \times (52 \times 10^{-6})}$

B $\dfrac{0.375 \times 8.31 \times 373}{200000 \times (52 \times 10^{-6})}$

C $\dfrac{0.375 \times 8.31 \times 373}{200000 \times 52}$

D $\dfrac{0.375 \times 8.31 \times 100}{200 \times (52 \times 10^{-6})}$