

Chem!stry

Name: ()

Class:

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Multiple Choice Questions on Kinetic Particle Theory

1. What can be deduced about two gases that have the same molecular mass?

- A They have the same solubility in water at room temperature.
- B They have the same boiling point.
- C They have the same number of atoms in one molecule.
- D They have the same rate of diffusion at room temperature.

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2. Which property of a gas affects the rate at which it spreads throughout a laboratory?

- A boiling point
- B molecular mass
- C reactivity
- D solubility in water

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3. A small amount of sugar was dissolved in a large volume of distilled water to form a **dilute** sugar solution. Which one of the following correctly describes the particles in the **dilute** sugar solution at room temperature and pressure?

	sugar molecules	water molecules
A	widely separated, moving at random	close together, moving at random
B	widely separated, moving at random	close together, not moving
C	widely separated, not moving	widely separated, moving at random
D	close together, moving at random	close together, moving at random

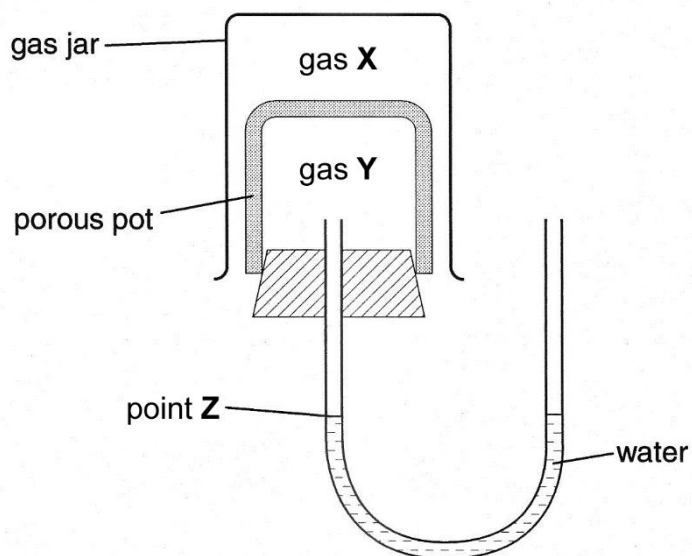
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4. Which one of the following lists contains chemicals that are all liquids at room temperature and pressure?

- A alcohol, bromine, mercury, water
- B alcohol, copper, oxygen, sulfur
- C bromine, carbon dioxide, iron, mercury
- D carbon dioxide, iodine, steel, water

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8. A gas jar containing gas **X** was inverted over a porous pot containing gas **Y**, shown in the diagram below.

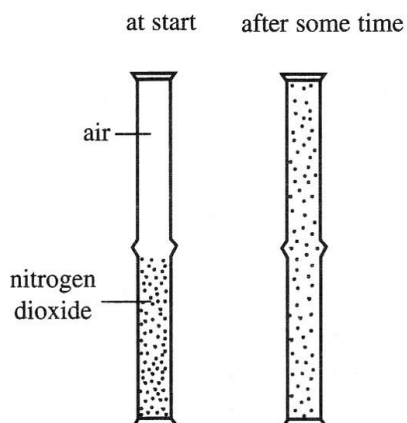


After several minutes, it was observed that the level of the water at point **Z** had **not** moved. Which combination of gases, **X** and **Y**, would give this observation?

- A** $X = \text{CH}_4$ $Y = \text{H}_2$ **B** $X = \text{CH}_4$ $Y = \text{NO}_2$
C $X = \text{CO}$ $Y = \text{N}_2$ **D** $X = \text{CO}$ $Y = \text{C}_3\text{H}_8$

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9. A gas jar of air was placed on top of a gas jar of nitrogen dioxide as shown in the diagram below.

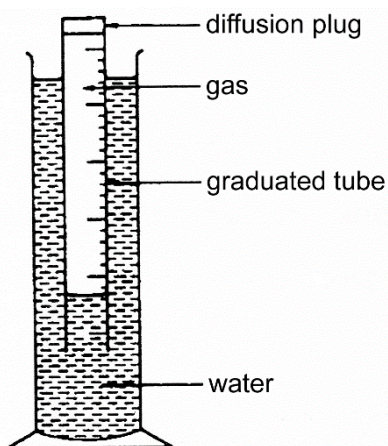


After some time, a uniform colour was seen throughout both gas jars. What process has taken place?

- A** combustion **B** decomposition
C diffusion **D** evaporation

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14. A student uses the setup shown below to determine the rate of diffusion of five different gases.



Time taken for 100 cm³ of each gas to diffuse through the diffusion plug at room temperature and pressure is shown below.

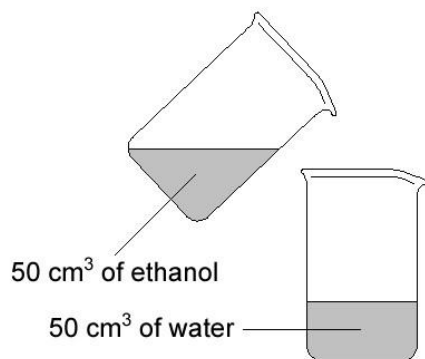
Gas	time / s
helium	28
neon	114
C _x H _y	130
chlorine	208
nitrogen	130

The student forgot the identity of the gaseous hydrocarbon, C_xH_y. Based on the data shown above, what are the values of **x** and **y**?

	value of x	value of y
A	1	4
B	1	6
C	2	4
D	3	6

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15. A 50 cm³ sample of alcohol was mixed with 50 cm³ of water.

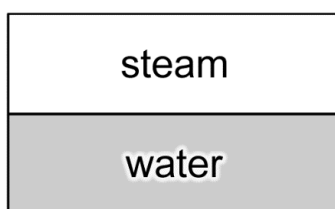


The volume of the mixed alcohol and water was found to be 97 cm³. Which of the following is the best explanation of this observation?

- A Some of the alcohol molecules evaporate.
- B The water molecules fit into gaps between the alcohol molecules.
- C The water and alcohol react to form a gas which escapes.
- D The water and alcohol react to form a salt which then dissolves.

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16. The diagram represents a closed vessel containing equal volumes of water and steam at 100 °C and atmospheric pressure.

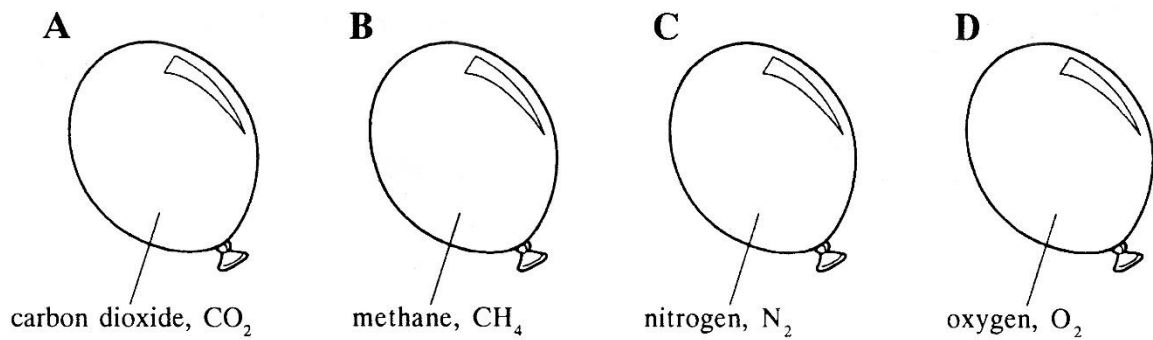


Which one of the following statements is correct?

- A Equal numbers of molecules are present in the steam and in the water.
- B The only type of movement possible for molecules in the water is vibration.
- C Molecules can move from the water into the steam and from the steam into the water.
- D An H₂O molecule in the steam is lighter than an H₂O molecule in the water.

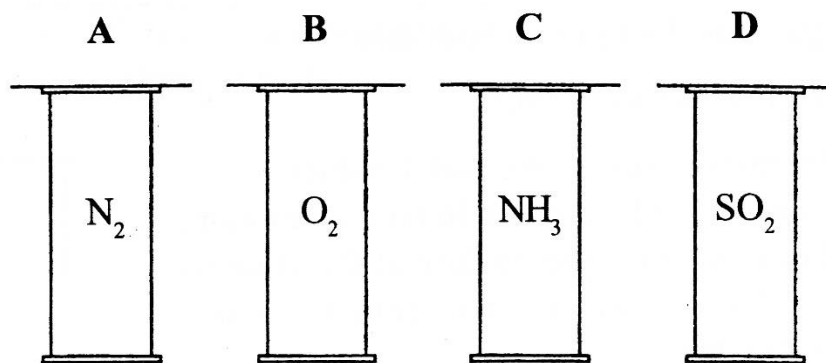
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17. An inflated balloon goes down because gas molecules can diffuse through the rubber. Four balloons are filled with different gases at the same temperature and pressure. Which balloon would go down most quickly?



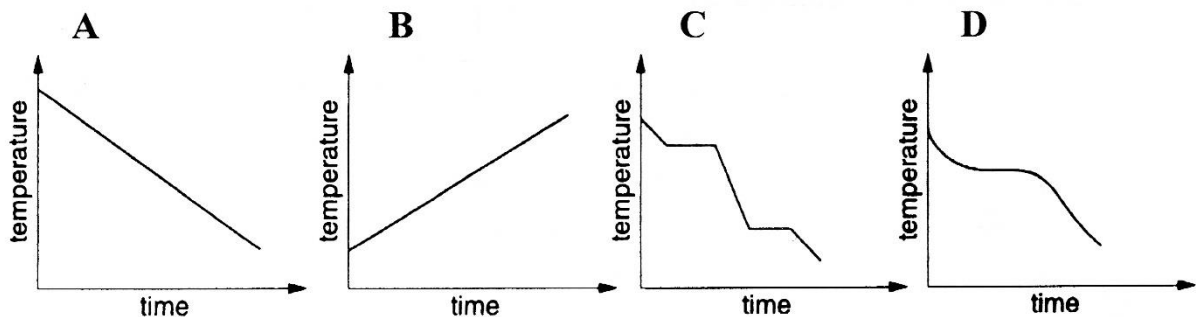
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18. Four identical gas jars are filled with different gases. The lids are removed from the gas jars, and they are left open to the air for a few hours. Which gas jar will then have the **most** air in it?



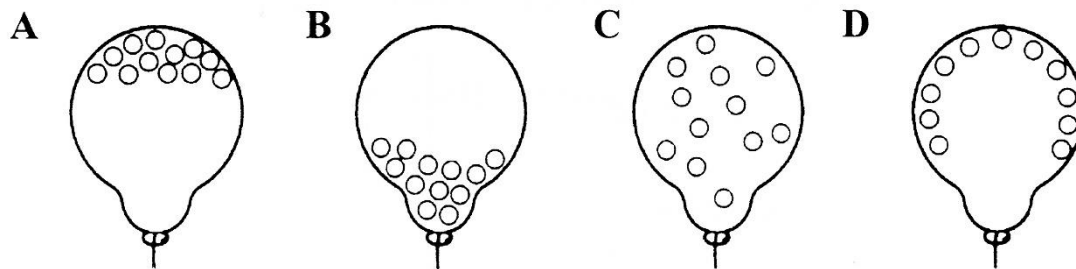
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19. Which graph of temperature against time correctly represents steam at $+120\text{ }^\circ\text{C}$ being cooled to ice at $-20\text{ }^\circ\text{C}$?



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20. Which diagram shows the correct arrangement of particles in a balloon filled with helium at room temperature and pressure?



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- Scan the QR code below for the answers to this assignment.



http://www.chemist.sg/kinetic_particle_theory/kpt_mcq_ans.pdf