Subject - Level	Chemistry - IGCSE
Topic 1	The Particulate nature of matter
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1. Kinetic theory explains the properties of matter in terms of the arrangement and movement of particles.

(a) Nitrogen is a gas at room temperature. Nitrogen molecules, N_2, are spread far apart and move in a random manner at high speed.
Compare the movement and arrangement of the molecules in solid nitrogen to those in nitrogen gas.
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(b) A sealed container contains nitrogen gas. The pressure of the gas is due to the molecules of the gas hitting the walls of the container.
Use the kinetic theory to explain why the pressure inside the container increases when the temperature is increased.
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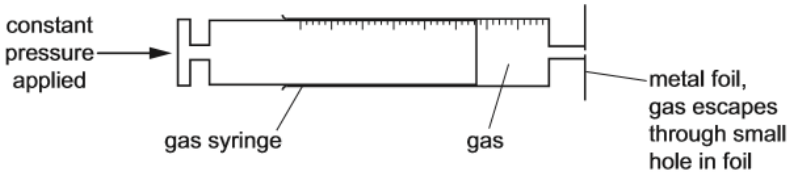
(c) The following apparatus can be used to measure the rate of diffusion of a gas.



The following results were obtained.

gas	Temperature (°C)	rate of diffusion in cm^3/ min
nitrogen	25	1.00
chlorine	25	0.63
nitrogen	50	1.05

(i) Explain why nitrogen gas diffuses faster than chlorine gas.
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(ii) Explain why the nitrogen gas diffuses faster at the higher temperature.
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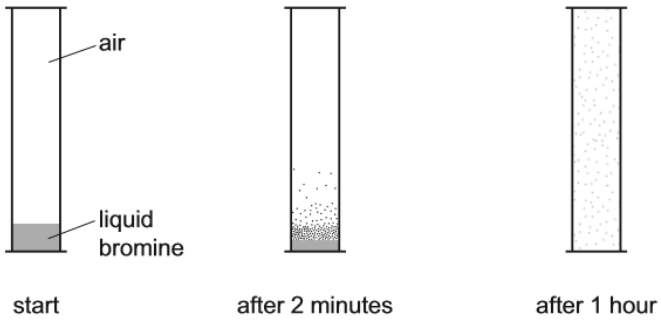
2. A teacher placed a small amount of liquid bromine in the bottom of a sealed gas jar of air. After two minutes red-brown fumes were seen just above the liquid surface. After one hour the red-brown colour had spread completely throughout the gas jar.



Use the kinetic particle model of matter to explain these observations.
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