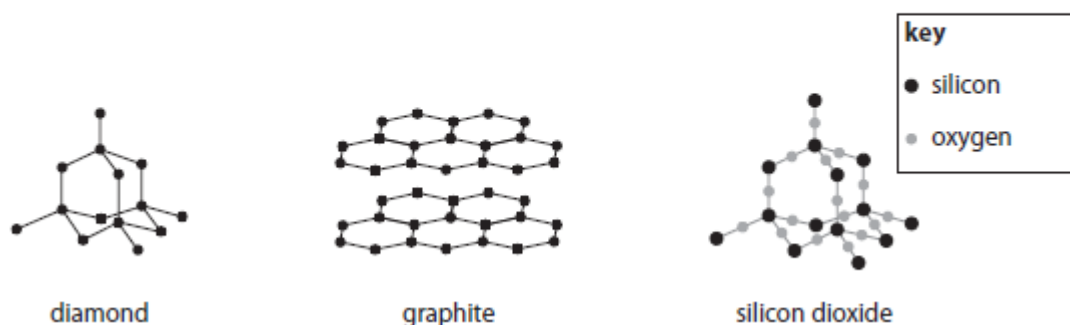


# Activity 3 – Chemistry

Paper 1C, Q7c

7 Diamond, graphite and silicon dioxide all have giant covalent structures.

The diagram shows the structures of these three substances.

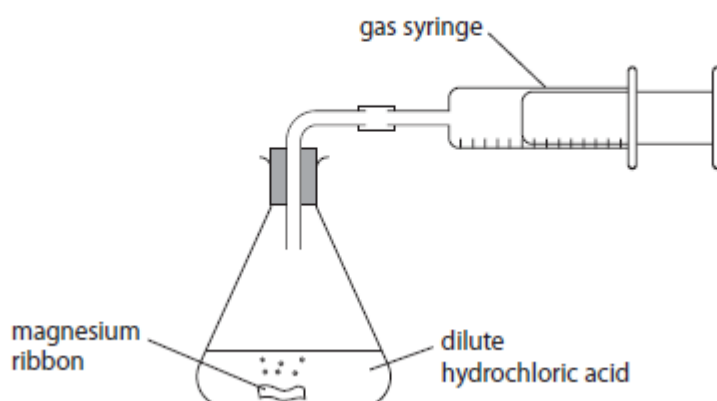


(c) State why diamond is hard but graphite is soft.

(2)

c	<p><b>M1</b> (diamond is hard because) it has a 3D lattice/rigid lattice /tetrahedral lattice /every carbon is bonded to four other carbons</p> <p><b>M2</b> (graphite is soft because) the layers can slide over one another</p>	<p><b>ALLOW</b> 3D/ rigid/ tetrahedral structure</p> <p><b>REJECT</b> mention of intermolecular forces in diamond</p> <p><b>IGNORE</b> mention of intermolecular forces between layers in graphite</p>	2
		<b>Total</b>	<b>6</b>

- 13 A student uses this apparatus to investigate the rate of reaction between magnesium and an **excess** of dilute hydrochloric acid.



- (e) The ionic equation for the reaction between magnesium and hydrochloric acid is



Use the information in this equation, and the particle collision theory, to explain why the rate of reaction decreases during each of the experiments.

(3)

13 e	<p>An explanation that links the following points:</p> <p><b>M1</b> the concentration of the acid/hydrogen ions/<math>\text{H}^+</math> (ions) decreases</p> <p><b>M2</b> therefore there are fewer (successful) collisions (between the hydrogen ions/<math>\text{H}^+</math> ions and the magnesium atoms)</p> <p><b>M3</b> per second/per unit time</p>	<p><b>ALLOW</b> there are fewer hydrogen ions/<math>\text{H}^+</math> (ions) in the same volume</p> <p><b>ALLOW</b> the surface area of the magnesium decreases</p> <p>less frequent collisions/ slower collision rate scores <b>M2</b> and <b>M3</b></p> <p><b>M3</b> dep on <b>M2</b></p> <p><b>IGNORE</b> less chance of collision</p> <p><b>MAX 1</b> if reference to energy of particles changing</p>	3
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