

Review topic: Bonding and structure

Ways to practice skills		R	A	G	Comment
2.4 Ions and ionic bonds					
1	Describe the formation of positive ions, known as cations, and negative ions, known as anions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	State that an ionic bond is a strong electrostatic attraction between oppositely charged ions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Describe the formation of ionic bonds between elements from Group I and Group VII, including the use of dot-and-cross diagrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Describe the properties of ionic compounds: a. high melting points and boiling points b. good electrical conductivity when aqueous or molten and poor when solid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Describe the giant lattice structure of ionic compounds as a regular arrangement of alternating positive and negative ions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Describe the formation of ionic bonds between ions of metallic and non-metallic elements, including the use of dot-and-cross diagrams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Explain in terms of structure and bonding the properties of ionic compounds: a. high melting points and boiling points b. good electrical conductivity when aqueous or molten and poor when solid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ways to practice skills		R	A	G	Comment
2.5 Simple molecules and covalent bonds					
1	State that a covalent bond is formed when a pair of electrons is shared between two atoms leading to noble gas electronic configurations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Describe the formation of covalent bonds in simple molecules, including H ₂ , Cl ₂ , H ₂ O, CH ₄ , NH ₃ and HCl. Use dot-and-cross diagrams to show the electronic configurations in these and similar molecules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Describe in terms of structure and bonding the properties of simple molecular compounds: a. low melting points and boiling points b. poor electrical conductivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Describe the formation of covalent bonds in simple molecules, including CH ₃ OH, C ₂ H ₄ , O ₂ , CO ₂ and N ₂ . Use dot-and-cross diagrams to show the electronic configurations in these and similar molecules	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Explain in terms of structure and bonding the properties of simple molecular compounds: a. low melting points and boiling points in terms of weak intermolecular forces (specific types of intermolecular forces are not required) b. poor electrical conductivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ways to practice skills		R	A	G	Comment
2.6 Giant covalent structures					
1	Describe the giant covalent structures of graphite and diamond	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Relate the structures and bonding of graphite and diamond to their uses, limited to: a. graphite as a lubricant and as an electrode b. diamond in cutting tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Describe the giant covalent structure of silicon(IV) oxide, SiO ₂	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Describe the similarity in properties between diamond and silicon(IV) oxide, related to their structures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ways to practice skills		R	A	G	Comment
2.7 Metallic bonding					
1	Describe metallic bonding as the electrostatic attraction between the positive ions in a giant metallic lattice and a 'sea' of delocalised electrons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Explain in terms of structure and bonding the properties of metals: a. good electrical conductivity b. malleable and ductile	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ways to practice skills		R	A	G	Comment
9.1 Properties of metals					
1	Compare the general physical properties of metals and non-metals, including: a. thermal conductivity b. electrical conductivity c. malleability and ductility d. melting points and boiling points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Describe the general chemical properties of metals, limited to their reactions with: a. dilute acids b. cold water and steam c. oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

	Ways to practice skills	R	A	G	Comment
9.2 Uses of metals					
1	<p>Describe the uses of metals in terms of their physical properties, including:</p> <p>a. aluminium in the manufacture of aircraft because of its low density</p> <p>b. aluminium in the manufacture of overhead electrical cables because of its low density and good electrical conductivity</p> <p>c. aluminium in food containers because of its resistance to corrosion</p> <p>d. copper in electrical wiring because of its good electrical conductivity and ductility</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Ways to practice skills		R	A	G	Comment
9.3 Alloys and their properties					
1	Describe an alloy as a mixture of a metal with other elements, including: e. brass as a mixture of copper and zinc f. stainless steel as a mixture of iron and other elements such as chromium, nickel and carbon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	State that alloys can be harder and stronger than the pure metals and are more useful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Describe the uses of alloys in terms of their physical properties, including stainless steel in cutlery because of its hardness and resistance to rusting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Identify representations of alloys from diagrams of structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Explain in terms of structure how alloys can be harder and stronger than the pure metals because the different sized atoms in alloys mean the layers can no longer slide over each other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	