Bonding: knowledge check

1. Complete the sentences.



* 1. The type of bonding in figure A is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. The type of bonding in figure B is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	3. The type of bonding in figure C is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
1. Complete the sentences.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding – this bond is formed when electrons are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from a metal atom to a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atom, forming positively charged ions and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ charged ions. Strong \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ attract the oppositely charged ions to each other.

1. Complete the sentences.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding – this bonding occurs between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ atoms. In a single covalent bond, a pair of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is shared between two atoms. These shared electrons are found in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ shells of the atoms. Each atom contributes one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the shared pair of electrons.

1. Complete the sentences usingsuitable words.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding – the electrons leave the outer shells of metal atoms, forming positive metal ions and a ‘sea’ of delocalised \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are free to move. This bond is the result of the strong \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of attraction between the positive metal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and the negative delocalised \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Bonding: test myself

Complete the sentences using suitable words.

1. What types of elements are involved in:
	1. ionic bonding? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. covalent bonding? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. metallic bonding? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In which type of bonding are electrons shared?

Electrons are shared in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonding.

1. What does the curved arrow represent in the diagram?



The arrow represents an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_from one atom to another.

1. What type of forces hold the particles together in an ionic bond?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forces of attraction hold the particles together in an ionic bond.

1. What does ‘delocalised’ mean?

Delocalised means that the electrons are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to move around.

1. What are the charged particles called in an ionic compound?

The charged particles in an ionic compound are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. What type of bonds do you find in a compound?

The bonds in a compound can be either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. Why are metals good conductors of electricity?

Metals are good conductors of electricity because they contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are free to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and carry the charge.

1. How do ionic compounds conduct electricity when solid, liquid and in solution? Explain your answer.

Ionic compounds cannot conduct electricity when they are in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ state because the ions are not free to move.
They can conduct electricity when they are in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or when they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and carry the charge.

1. Why are most covalent substances non-conductors of electricity?

Most covalent compounds do not conduct electricity because they do not have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ particles (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) that can move and carry the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

Bonding: feeling confident?

Complete the bonding diagrams.

1. The reaction between magnesium and fluorine.



1. The reaction between hydrogen and chlorine.



1. The metallic bonding in zinc.



Bonding: what do I understand?

Think about your answers and confidence level for each mini-topic. Decide whether you understand it well, are unsure or need more help. Tick the appropriate column.

|  |  |  |  |
| --- | --- | --- | --- |
| **Mini-topic** | **I understand this well** | **I think I understand this** | **I need more help** |
| I can identify ionic, covalent and metallic bonds from diagrams. |  |  |  |
| I know that there are ions in ionic bonds. |  |  |  |
| I know about electrostatic forces in ionic bonds. |  |  |  |
| I know that electrons are shared in covalent bonds. |  |  |  |
| I know that there are positive metal ions and negative delocalised electrons in metallic bonds. |  |  |  |
| I know the types of elements involved in:* ionic bonds
* covalent bonds
* metallic bonds.
 |  |  |  |
| I can explain why metals conduct electricity. |  |  |  |
| I can explain the conditions required for ionic compounds to conduct electricity. |  |  |  |
| I can explain why covalent substances do not conduct electricity. |  |  |  |
| **Feeling confident? topics** | **I understand this well** | **I think I understand this** | **I need more help** |
| I can draw diagrams to represent ionic and covalent bonds. |  |  |  |