**Metallic bonding:** **knowledge check**

1. What type of bonding does this diagram represent? Circle the correct answer.

covalent bonding ionic bonding metallic bonding

**A diagram representing bonding.

On the left are 5 large circles with Na in the centre and a single cross on the circle. The circles are not touching. An arrow in the centre points towards the right. On the right are 5 smaller circles with Na+ in the centre. The circles are not touching. They are arranged in a uniform lattice. In between the circles are five crosses distributed randomly.**

1. Use the words to complete the sentences. You may use the words more than once.

electrons electrostatic forces ions metallic

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_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 bonding is a result of the strong \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of attraction between the positive metal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the negative delocalised \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Metallic bonding:test myself

Use the words to complete the sentences.

1. What types of elements are involved in metallic bonding?

metal and non-metal metals only non-metals only

Metallic bonds are found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­­­­­.

1. Are metallic bonds strong or weak?

strong weak

Metallic bonds are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. What does ‘delocalised’ mean?

atoms electrons ions

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are free to move.

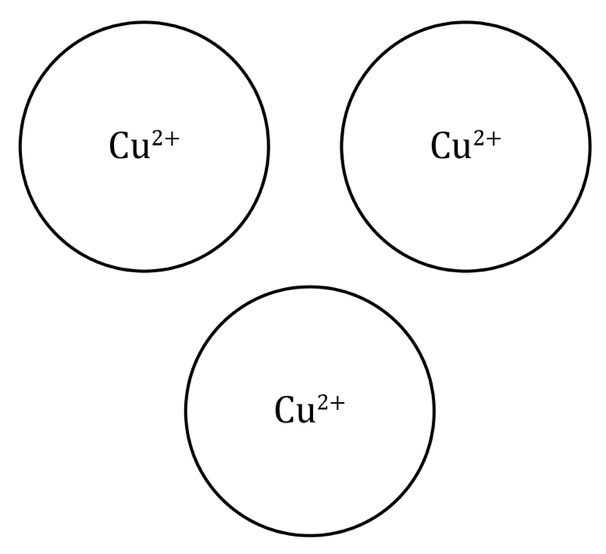
1. Why are metals good conductors of electricity?

atoms charge delocalised electrons

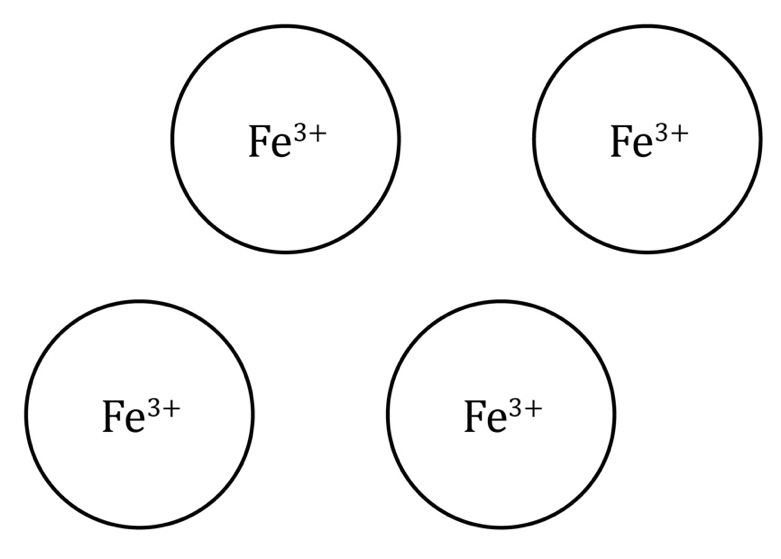
Metals are good conductors of electricity because they contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that are free to move and carry the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Metallic bonding:feeling confident?

1. Complete the diagram to represent the metallic bonding in copper.



1. Complete the diagram to represent the metallic bonding in iron.



Metallic 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 interpret diagrams representing metallic bonds. |  |  |  |
| I know that there are positive metal ions and negative delocalised electrons in metallic bonds. |  |  |  |
| I know about electrostatic forces in metallic bonds. |  |  |  |
| I can explain why metals conduct electricity. |  |  |  |
| **Feeling confident? topics** | **I understand  this well** | **I think I understand this** | **I need more  help** |
| I can complete diagrams to represent the formation of metallic bonds. |  |  |  |