**Chemistry Revision: Types of Bonding**

Mastery Matrix Points

|  |
| --- |
| Describe the structure and properties of giant ionic structures |
| Link the structure of giant ionic structures to its properties |
| Describe the structure and properties of simple covalent structures |
| Describe the structure and properties of giant covalent structures (including diamond, graphite and silica) |
| Compare and contrast giant carbon structures (diamond, graphite, graphene and fullerene – Buckminster fullerenes and nanotubes as examples) (triple only) |
| Describe two uses of nanotechnology (triple only) |
| Describe how a substance bonds metallically |
| Link the structure of giant metallic structures to their properties  |

Key Knowledge

Ionic bond –

Covalent bond –

Metallic bond –

Alloy –

Lattice structure (definition and picture) –

Nanoparticle definition –

Corse particles (dust) –

Ways of showing bonding and their drawbacks:

|  |  |  |
| --- | --- | --- |
| *Name of model* | *Example* | *Limitations* |
| Ball and stick | Image result for ball and stick model ionic |  |
| Dot and cross | Image result for dot and cross model |  |
| 2D models | Image result for display formula ethane |  |
| 3D models | Image result for ball and stick model ionic |  |

Examples of simple covalent molecules –

Examples of giant covalent molecules –

Uses of fullerenes –

Uses of nanoparticles -

Understanding and Explaining

1. Describe and explain the properties of simple covalent molecules.

|  |  |
| --- | --- |
| *Property* | *Explanation* |
|  |  |
|  |  |

1. Describe and explain the properties of ionic compounds.

|  |  |
| --- | --- |
| *Property* | *Explanation* |
|  |  |
|  |  |

1. Describe and explain the properties of metallic structures.

|  |  |
| --- | --- |
| *Property* | *Explanation* |
|  |  |
|  |  |
|  |  |

1. Describe and explain the properties of each of these giant covalent structures.

|  |  |  |  |
| --- | --- | --- | --- |
| *Name* | *Structure* | *Properties* | *Explanations* |
| Diamond |  |  |  |
|  |  |
|  |  |
| Graphite |  |  |  |
|  |  |
| Graphene |  |  |  |
|  |  |
| Fullerenes |  |  |  |
|  |  |
| Polymers |  |  |  |

1. Explain why the properties of nanoparticles are different from the same material in bulk, making them more effective.
2. What are the possible risks associated with nanoparticles?
3. Explain why alloys are harder and less malleable that the pure metals they are made from.