METALS AND NON METALS

NAME

Mercury • Sodium • Graphite (carbon) • Lithium • Potassium • Silicon

1. These are unusual elements. Complete the table to show how they are unusual:

|  |  |
| --- | --- |
| **Element** | **Why is it unusual?** |
| Mercury |  |
| Lithium |  |
| Sodium |  |
| Potassium |  |
| Silicon  |  |
| Graphite (carbon) |  |

1. On the outline of the Periodic Table below:

**a** colour code the metals and non-metals

**b** highlight the semi-metals silicon and germanium, and the element carbon.

**c** colour code the Group I metals

**d** annotate the table to show the unusual properties.

**Li**

**Na**

**K**

**Rb**

**Cs**

**Be**

**Mg**

**Ca**

**Sr**

**Ba**

**Sc**

**Y**

**La**

**Ti**

**Zr**

**Hf**

**V**

**Nb**

**Ta**

**Cr**

**Mo**

**W**

**Mn**

**Tc**

**Re**

**Fe**

**Ru**

**Os**

**Co**

**Rh**

**Ir**

**Ni**

**Pd**

**Pt**

**Cu**

**Ag**

**Au**

**Zn**

**Cd**

**Hg**

**B**

**Al**

**Ga**

**In**

**Tl**

**C**

**Si**

**Ge**

**Sn**

**Pb**

**N**

**P**

**As**

**Sb**

**Bi**

**O**

**S**

**Se**

**Te**

**Po**

**F**

**Cl**

**Br**

**I**

**At**

**Ne**

**Ar**

**Kr**

**Xe**

**Rn**

**He**

**H**

**2**

**3**

**4**

**5**

**6**

**1**

**1**

**2**

**3**

**0(8)**

**7**

**6**

**5**

**4**

**groups**

**periods**

**transition metals**

 Structure and properties

When solids conduct electricity, very small particles called electrons move and carry the charge. Electrons are one of the particles that make up atoms. Metals can conduct electricity because of their structure. In a solid piece of metal, the atoms loose some of their outer electrons. These can move through the metal and make an electrical current.

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1. What do the grey spheres represent in the diagram?

1. What does the on the diagram represent?

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1. Why can metals conduct electricity?

1. What does this tell you about non-metals?

Now look at the structures of diamond and graphite below.



Diamond and graphite are different forms of the element carbon. The difference is that the atoms are bonded in different patterns.

Diamond is a strong structure. Each atom makes four bonds. Chemical bonds involve electrons. This is why diamond is the hardest natural substance known.

Graphite is not as hard as diamond. Each atom only makes three bonds. This means that each carbon atom has a free electron and these can move about between the layers of graphite and carry an electric charge.

1. How are diamond and graphite different structurally?

1. Why can graphite conduct electricity?

1. Why doesn’t diamond conduct electricity?