Worksheet 2.7.7 How to extract metals

1 Getting the ore >

For thousands of years, people have wanted metal. From making simple tools and weapons to building bridges and aeroplanes, metal has been an essential material. Metal is rarely found in a pure form in the ground though but is usually a compound. We call this an ore.

This table includes some examples. Look at this and enter the names of the elements present:

|  |  |  |
| --- | --- | --- |
| **Ore** | **Chemical name** | **Elements present in the ore** |
| Hematite | Iron oxide |  |
| Cassiterite | Tin oxide |  |
| Bauxite | Aluminium hydroxide |  |
| Chalcosite | Copper sulfide |  |

2 Extracting the metal >>

Metals are extracted from ores on a huge scale, producing thousands of tonnes a year. However, some of these processes can be done on a laboratory scale. For example, if lead oxide is mixed with carbon (powdered charcoal, for example) and heated strongly, the result is lead and carbon dioxide.

1. What has happened between the carbon and the oxygen?
2. What this say about the reactivity of lead compared with that of carbon?
3. Write down a word equation showing reactants and products.
4. A similar experiment can be done with copper – what would the word equation be in this case?

3 Recycling >>>

Extracting metals from their ore is expensive and damaging. Digging out the ore often damages the landscape and it takes a lot of energy to process the ore. Furthermore, dumping old metal products may poison the land.

1. Suggest why, even though there are strong arguments for recycling, quite a lot of metal still isn’t recycled.
2. When a car reaches the end of its life and is scrapped, it contains a variety of different metals. Why is recycling this not always easy?