Extracting Metals by Reduction with Carbon

In this experiment, you will use carbon to extract copper from copper oxide.

Method

1. Place one heaped spatula of copper oxide and one of charcoal powder (carbon powder) in a crucible.
2. Mix the powders together and tap the crucible on the work surface gently to level the mixture.
3. Sprinkle a layer of charcoal powder over the top of the mixture so that it is completely covered.
4. Put a lid on the crucible and place the crucible over a Bunsen burner.
5. Heat the crucible gently for 1 minute, and then more strongly for 5 minutes.
6. Turn off the Bunsen burner and leave your crucible to cool.

Answer the questions below

1. What does your metal oxide look like before heating?

2. Why is it important to mix the metal oxide and charcoal well?

3. Why do you cover the mixture in the crucible with a layer of charcoal?

4. Why must you let the mixture cool in the crucible before looking at it?

5. Write a word equation for this reduction reaction

6. Describe in words what has happened, using the key terms oxidation (or oxidised), reduction (or reduced) and reducing agent.

7. Write a balanced symbol equation for the reaction.

8. Once your crucible has cooled down, tip the contents onto a paper towel. What can you see?

9. Copper can be extracted from copper oxide using reduction with carbon, but aluminium cannot be extracted using reduction with carbon. Explain why this is using key terms.