

Extraction of Metals Exam Questions Teacher Modelled Answer

Metals are extracted by different methods which are linked to their position in the reactivity series of metals.

Zinc is extracted from its ore by reduction with carbon (zinc is less reactive than carbon)

Silver is found uncombined in the Earth's crust (silver is very unreactive, probably the least reactive)

Sodium is extracted from its ore using electrolysis (sodium is more reactive than carbon) more expensive as electricity is used

Below is a reactivity series with three metals missing. Use the information given about the extraction methods to work out where zinc, silver and sodium fit into the reactivity series.

Potassium, _____, Aluminium, Carbon, _____, Iron, Copper, _____, Gold

Model Answer

Silver is placed between copper and gold in the reactivity series. This is because it is the least reactive of the three metals. I know it is the least reactive as it is found uncombined in the earth's crust, which means that it hasn't reacted with any other element. Since silver is found as an uncombined element, it is easy and cheap to recover it from the earth.

Zinc is between carbon and iron in the reactivity series. This is because it is less reactive than carbon. We know it is less reactive than carbon because carbon can be used to extract zinc from its ore. Electrolysis could also be used to extract zinc from its ore. However, it is much more expensive than using reduction with carbon so electrolysis is only used when the metal is more reactive than carbon.

Sodium is between potassium and aluminium in the reactivity series. We know this because it is extracted from its ore using electrolysis. This is only used when the metal is more reactive than carbon because it is a very expensive method. Reduction with carbon will not work as there will be no reaction. A displacement reaction only works if the element is more reactive than the one in the compound.