

Metals and corrosion - lab report example



Metals and corrosion

September 8, Metals and Corrosion Experiment Introduction Corrosion is as a result of presence of Iron II Oxide. Iron II oxide is formed as a result of oxidation of Iron III Oxide in the presence of Oxygen and moisture. These results in a yellow paste referred to a rust. The formation of the rust eats up the upper most layers in the material involved and as a result, there is corrosion.

Metals are substances which lose electrons to form positive ions otherwise known as cations. Metals have different properties depending on the position of a particular metal in the periodic table. The physical properties of metals include: high conductivity, less brittleness, high strength, ductility, malleability and good electrical conductors. Metals react with acids to give the metal salt and water. The purpose of this experiment is the determination of the different properties of metals. The properties determined include conductivity, hardness, and Brittleness. Also, the ability of copper, iron and brass to resist corrosion was investigated in this experiment.

Experimental

Each of the following properties of the iron, brass and copper were determined and comparison made across all the metals.

Conductivity

The three metals were heated at the same heat rate. The time taken for heat to move from one end to the other was determined and recorded.

Brittleness

Wires made from copper, brass and iron were bent severally. The number of

times the wire was bent before breaking was observed and recorded.

Hardness

The hardness of the three metals were determined using the scratch test. This was whereby each metal was scratched by a standard object and the easiness with which a mark was made was determined.

Corrosion

All the three metals were placed in three different open beakers containing tap water and left there for 3 days. After the three days, the changes in the physical appearance of the metal was observed and recorded

Data and Observations

Corrosion

After the specified period, the beakers containing iron and brass had a yellowish solution. This is the rust. The beaker containing copper had no observable change.

Conductivity

When one end of the three metals were heated and time taken for the heat to be transferred from the end being heated to the other opposite end taken, it was found that it was faster in copper than in iron and brass.

Hardness

It was found that iron was harder as compared to copper. Despite the alloy of the two which is brass was harder than the two.

Brittleness

The number of times the copper wire was bent before breaking was 22. For iron, it was 5.

Discussion

From the experiment, it can be determined that iron and brass are prone to

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corrosion as compared to copper. Also, comparison of the brittleness of the three indicates that iron is more brittle as compared to copper and brass.

The alloy of copper and iron, brass is harder than the pure metals.

In terms of conductivity, copper has high conductivity as compared to brass and iron.

Conclusion

From the experiment, it can be concluded that copper metal is a good conductor of heat, iron is more brittle and brass is harder. Also, it can be concluded that, substances containing iron are more prone to corrosion as compared to substance lacking iron. This is due to the presence of iron(II) Oxide that is converted to iron(III) Oxide which is the rust that causes corrosion.