

Answer on Question #48311 - Chemistry – Other

Question

electrolysis is a very important chemical process in many industries. this is because a lot of industrial processes apply electrolysis process to obtain the desired products.

1. state the meaning of electrolysis

2. describe the electrolysis process of molten lead(II) chloride using carbon electrodes in the laboratory. in your explanation include the half-equation involved

Answer:

1. Electrolysis is a chemical decomposition reaction produced by passing an electric current through a solution containing ions. Electrolysis is commercially highly important as a stage in the separation of elements from naturally occurring sources such as ores using an electrolytic cell. Electrolysis is used for many purposes, including the cleaning of archaeological artifacts, and the coating of materials with thin layers of metal (electroplating). One important use of electrolysis of water is to produce hydrogen.

2. Carbon electrodes are dipped into molten lead(II) chloride which has been strongly heated in a crucible. The electrolyte molten lead(II) chloride PbCl_2 , provides a high concentration of lead(II) ions Pb^{2+} and chloride ions Cl^- to carry the current during the electrolysis process.

The positive lead(II) ions are attracted to the negative electrode and are discharged to form molten lead. This is a reduction reaction because the lead ions gain electrons:



The negative chloride ions are attracted to the positive anode electrode and discharged to form chlorine vapor. This is an oxidation reaction because the chloride ions lose electrons:



Overall equation for the electrolysis of molten lead(II) chloride:

