**CHEMISTRY HONORS LAB 5.7**

ELECTROLYSIS

Introduction

Molten ionic compounds conduct electricity and can therefore be electrolysed.

Aqueous solutions of ionic compounds conduct electricity and can also be electrolysed.

All aqueous solutions contain H+ and OH- ions in addition to the ions from the ionic compound.

It is possible to predict the products of the electrolysis of a molten or aqueous electrolyte.

Procedure

Watch the videos and answer the questions

You do not need to watch the entire length of the video; just enough to answer the questions.

1. the electrolysis of molten PbBr2 <https://www.youtube.com/watch?v=cpf9oNRZy-w>

|  |  |  |
| --- | --- | --- |
| (a) | Why does no current flow when the PbBr2 is solid? |  |
| (b) | Write an equation for the half-reaction occurring at the cathode. |  |
| (c) | Write an equation for the half-reaction occurring at the anode |  |
| (d) | Write the net ionic equation for the reaction |  |
| (e) | Electrolysis is used commercially to prepare sodium from NaCl and aluminium from Al2O3, but it is rarely used to prepare lead. Why is this? |  |

1. the electrolysis of NaOH(aq) [www.youtube.com/watch?v=vFR9zUGt2C4](http://www.youtube.com/watch?v=vFR9zUGt2C4)

|  |  |  |
| --- | --- | --- |
| (a) | Write an equation for the half-reaction occurring at the cathode |  |
| (b) | Write an equation for the half-reaction occurring at the anode |  |
| (c) | Write the net ionic equation for the reaction |  |
| (d) | What substance is being electrolysed in this reaction? |  |
| (e) | Explain why different volumes of gas were produced at the two electrodes |  |

1. The electrolysis of KI(aq) [www.youtube.com/watch?v=cV35DHVeNm8](http://www.youtube.com/watch?v=cV35DHVeNm8)

|  |  |  |
| --- | --- | --- |
| (a) | Write an equation for the half-reaction occurring at the cathode |  |
| (b) | Write an equation for the half-reaction occurring at the anode |  |
| (c) | Write the net ionic equation for the reaction |  |
| (d) | Explain what you saw at the cathode |  |
| (e) | Explain what you saw at the anode |  |
| (f) | Why did the solution gradually turn pink? |  |

1. The electrolysis of CuCl2(aq) [www.youtube.com/watch?v=mIT-\_nghOB4](http://www.youtube.com/watch?v=mIT-_nghOB4)

|  |  |  |
| --- | --- | --- |
| (a) | Write an equation for the half-reaction occurring at the cathode |  |
| (b) | Write an equation for the half-reaction occurring at the anode |  |
| (c) | Write the net ionic equation for the reaction |  |
| (d) | How did the demonstrator identify the product at the cathode? |  |
| (e) | How did the demonstrator identify the product at the anode? |  |
| (f) | What does the result of this experiment tell you about the molarity of the CuCl2(aq) solution used, and why? |  |

1. Electroplating a metal with copper <https://www.youtube.com/watch?v=gTjWkeSpRqk>

|  |  |  |
| --- | --- | --- |
| (a) | Write an equation for the half-reaction occurring at the cathode |  |
| (b) | Write an equation for the half-reaction occurring at the anode |  |
| (c) | How would you change this apparatus to coat an iron nail with a layer of silver? |  |