**Predicting the products of electrolysis**

**Qn**. **Predict** the products of the electrolysis of:

**CuCl2(l) CuCl2(aq) CuCl2(c) CuCl2(aq):Cu electrodes**

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| --- | --- | --- | --- |
| **Species present**: Cu2+, Cl- | **Species present**: Cu2+, Cl-,H2O | **Species present**: Cu2+, Cl-,H2O | **Species present**: Cu2+, Cl-, H2O, Cu |
| **Relevant** half-equations  Cl2(g) + 2e- ⇄**2Cl-**(aq) 1.36    **Cu2+**(aq) + 2e- ⇄ Cu(s) 0.34  **Bold print** = present  Underlined =actually reacting | **Relevant** half-equations  Cl2(g) + 2e- ⇄**2Cl-**(aq) 1.36  O2(g)+4H+(aq)+4e- ⇄**2H2O**(l) 1.23  **Cu2+**(aq) + 2e- ⇄ Cu(s) 0.34  **2H2O**(l) + 2e- ⇄H2(g)+2OH-(aq) -0.83 | **Relevant** half-equations  Cl2(g) + 2e- ⇄**2Cl-**(aq) 1.36  O2(g)+4H+(aq)+4e- ⇄**2H2O(l**) 1.23  **Cu2+**(aq) + 2e- ⇄ Cu(s) 0.34  **2H2O**(l) + 2e- ⇄H2(g)+2OH-(aq) -0.83  **Strongest oxidant reacts with strongest reductant** | **Relevant** half-equations  Cl2(g) + 2e- ⇄**2Cl-**(aq) 1.36  O2(g)+4H+(aq)+4e- ⇄**2H2O**(l) 1.23  **Cu2+**(aq) + 2e- ⇄ **Cu(s**) 0.34  **2H2O**(l) + 2e- ⇄H2(g)+2OH-(aq) -0.83 |
| **Reactions occurring**  2Cl-(l) 🡪 Cl2(g) + 2e- anode  Cu2+(l) + 2e-🡪 Cu(l) cath  2Cl-(l)+ Cu2+(l)🡪Cu(l)+Cl2(g) | **Reactions occurring**  2H2O(l) 🡪 O2(g)+4H+(aq)+4e anod  Cu2+(aq) + 2e-🡪 Cu(s) cath  2H2O(l) + 2Cu2+(aq)🡪 2Cu(s) + O2(g) +4H+(aq) | **Reactions occurring**  2Cl-(l) 🡪 Cl2(g) + 2e- anode  Cu2+(l) + 2e- 🡪 Cu(s) cath  2Cl-(aq)+ Cu2+(aq)🡪Cu(s)+Cl2(g) | **Reactions occurring**  Cu(s) 🡪 Cu2+(aq) + 2e- anode  Cu2+(aq) + 2e- 🡪 Cu(s) cath  Cu(s) + Cu2+(aq)🡪Cu(s) + Cu2+(aq) |
| **Products**  Copper metal and chlorine gas | **Products**  Copper metal and oxygen gas | **Products**  Copper metal and chlorine gas | **Products**  Copper ions and copper metal |