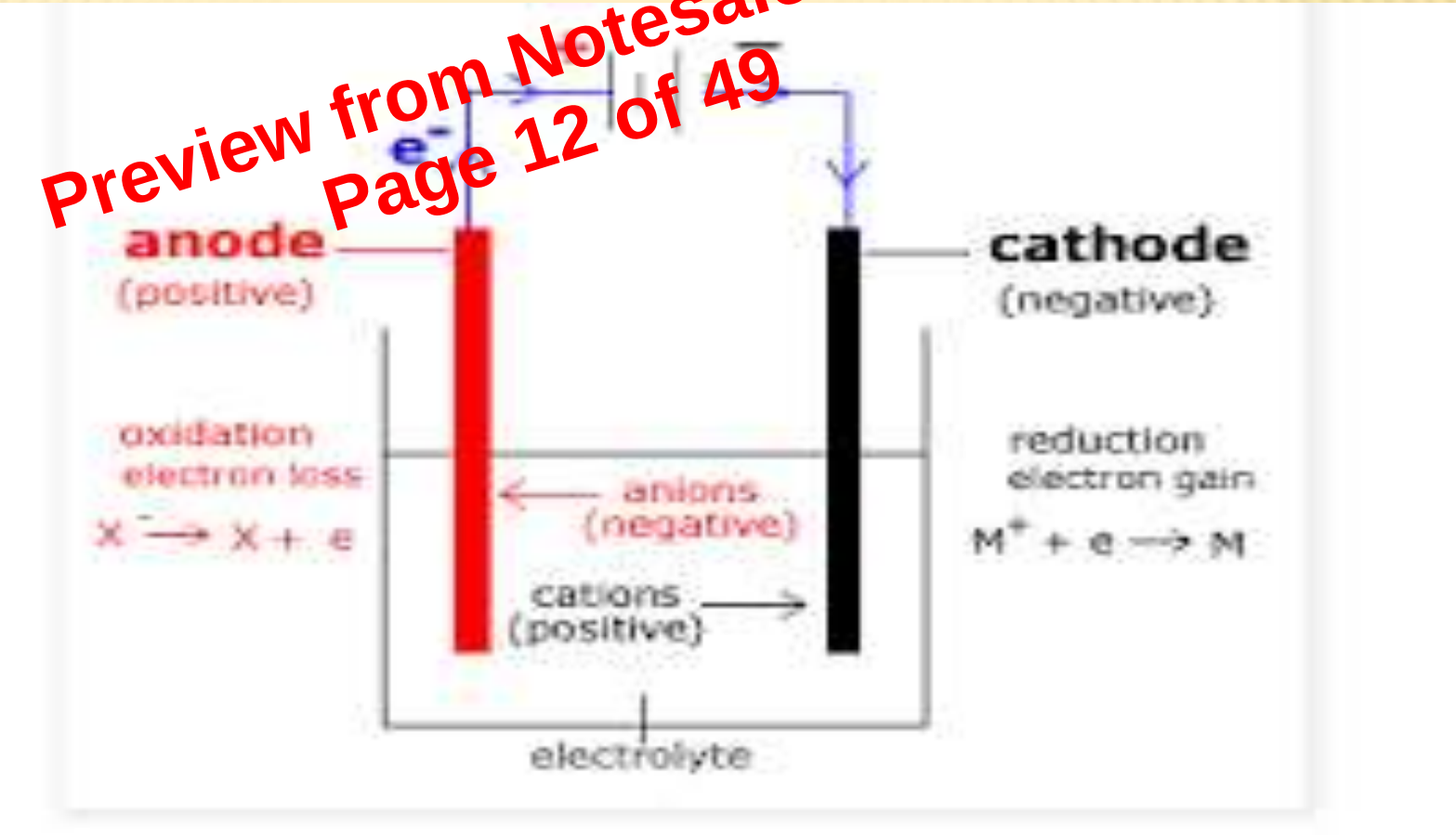
ELECTROLYTES: IONS ARE MOVING

- Conductivity in electrolytes is due to the presence of mobile ions. The positive and negative ions are separated, and it is this separation that results in the decomposition of the electrolyte.

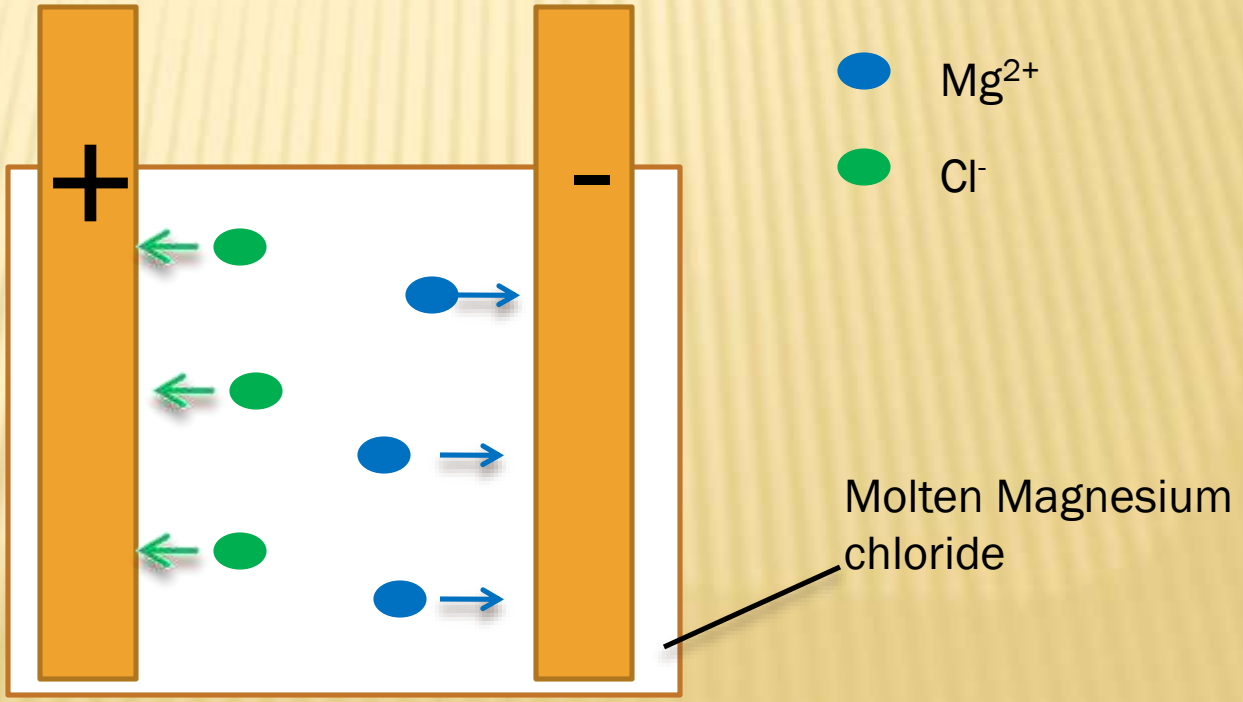
ELECTROLYSIS



An electrolytic Cell

ELECTROLYSIS

- The movement of ions in the electrolysis of molten magnesium chloride.



ELECTROLYSIS

The ions in solution are:

From water

$H_2O \rightarrow H^+ + OH^-$

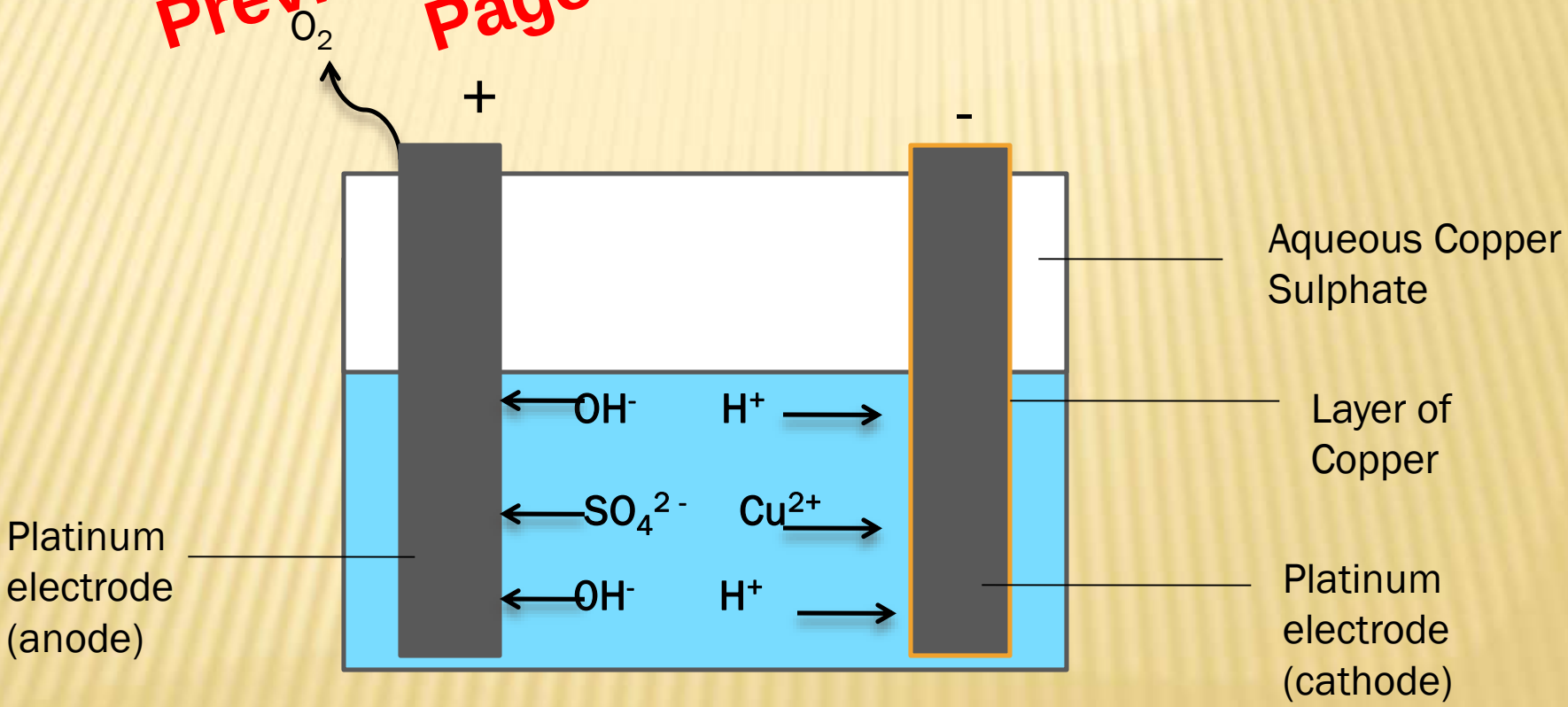
From Sodium Chloride

$NaOH \rightarrow Na^+ + Cl^-$

The H^+ ions and Na^+ move towards the cathode where the Hydrogen is preferentially discharge as (H_2) base on the electrochemical series. While, OH^- move towards the anode, and discharge as O_2. Here very little chlorine is evolved under these conditions.(diluted)

ELECTROLYSIS

- Electrolysis of aqueous Copper Sulphate(dilute)



OX: Anode: $4OH^-(aq) \rightarrow 2H_2O\ (l) + O_2(g) + 4e^-$ **Red: Cathode:** $Cu^{2+}\ (aq) + 2e^- \rightarrow Cu^o(s)$

ELECTROLYSIS-MOLES APPLIED

- Michael Faraday the British scientist did work on electrolysis. He discovered the mass of a substance discharged at an electrode during electrolysis is directly proportional to the quantity of electricity passing through the electrolytic cell.
- $M \alpha Q$
- Where Q – quantity of electricity in coulombs and m= mass of substance

ELECTROLYSIS-MOLES APPLIED

When 1 mole of a **singly charge ion** is discharged at an electrode the following happens.

Cation: $M^+ + e^- \rightarrow M$

Anion: $X \rightarrow + X^- + e^-$

This process requires a passage of 96500C(or addition or removal of 1 mole of electrons)

ELECTROLYSIS-MOLES APPLIED

- Try same question with molten NaCl, with I=8 A t=4hrs Ar, Na=23 Ar, Cl =35.5
- Answer
- Answers:
- Moles Of Na atom=1.2mol Na
- The Mass of Na atoms = 27.46g Na
- Moles Of Cl_2 atom=0.60mol Cl_2
- The Mass of Cl_2 Atoms = 42.6 Cl_2