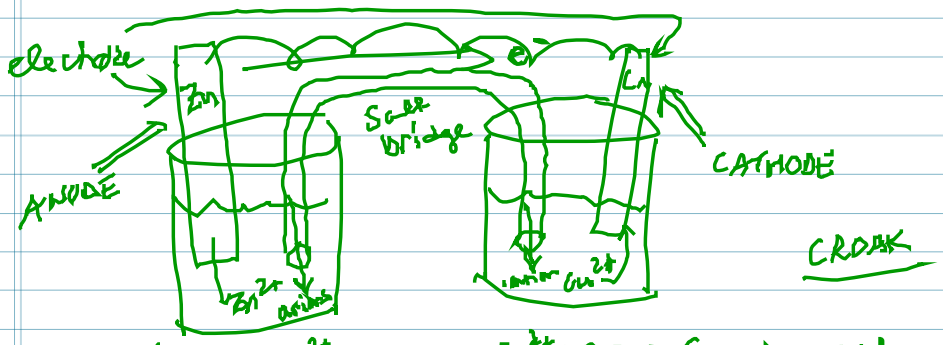
ELECTROCHEMICAL CELLS "galvanic cells" "voltaic cells"

→ use a spontaneous redox reaction

chemical E → electrical energy



oxidation $Zn^0 \rightarrow Zn^{2+} + 2e^-$ $Cu^{2+} + 2e^- \rightarrow Cu$ reduction

overall reaction $Zn^0 + Cu^{2+} \rightarrow Zn^{2+} + Cu^0$

Zn electrode is losing mass, $[Zn^{2+}] \uparrow$

Cu electrode is gaining mass, $[Cu^{2+}] \downarrow$

electric current flows through the wire from the anode to the cathode because of a difference in reduction potential (FORCE)

pull on the electrons → measured as VOLTAGE

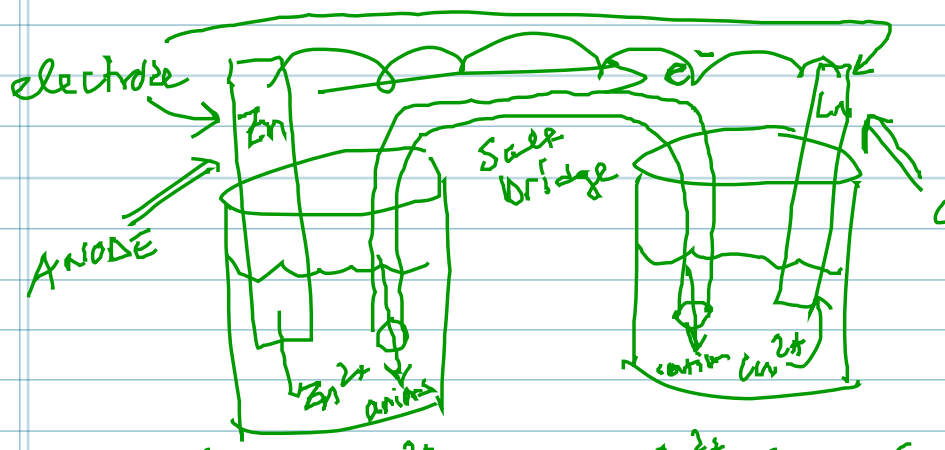
voltage → emf → electrical potential

cell notation anode | anode ion || cathode ion | cathode

$Zn \mid Zn^{2+} \parallel Cu^{2+} \mid Cu$

ELECTROCHEMICAL CELLS "galvanic cells" "voltaic cells"

→ use a spontaneous redox reaction
chemical E → electrical energy



CROAK

OXIDATION $Zn^0 \rightarrow Zn^{2+} + 2e^-$ $Cu^{2+} + 2e^- \rightarrow Cu$ REDUCTION

overall reaction $Zn^0 + Cu^{2+} \rightarrow Zn^{2+} + Cu^0$

Zn electrode is losing mass, $[Zn^{2+}] \uparrow$
Cu electrode is gaining mass, $[Cu^{2+}] \downarrow$

electric current flows through the wire from the anode to the cathode because of a difference in reduction potential (FORCE)

pull on the electrons → measured as VOLTAGE

voltage → emf → electrical potential

cell notation anode | anode ion || cathode ion | cathode

$Zn \mid Zn^{2+} \parallel Cu^{2+} \mid Cu$

$E^\circ_{cell} = E^\circ_{cathode} - E^\circ_{anode}$

$= 0.34V + +0.76V$

$E^\circ_{cell} = 1.10V$

$Mg | Mg^{2+} || Pb^{2+} | Pb$

$Mg^\circ \rightarrow Mg^{2+} + 2e^-$ $\quad E^\circ_{cell} = -0.13V - -2.37V$

$2e^- + Pb^{2+} \rightarrow Pb$ $\quad E^\circ_{cell} = 2.24V$

$Br_2(l)$ is dripped into an aqueous mixture of NaCl & NaI.

What happens?

in the dish: ~~Na^+~~, Cl^-, I^-, Br_2