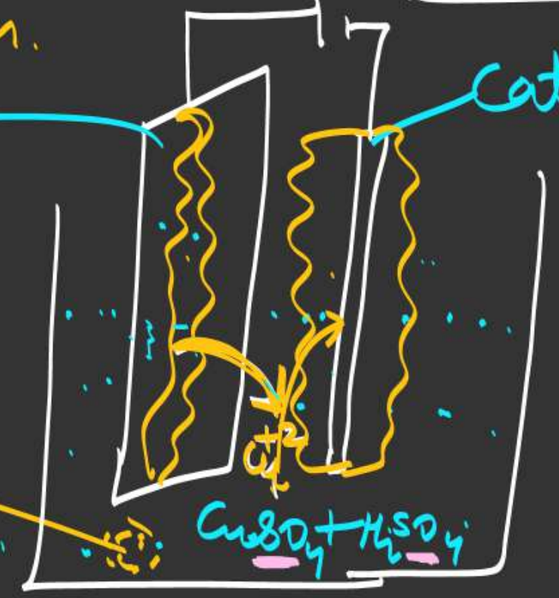
Cu Mn Zn Cr Fe Pb Ag Au — Purification

Impurities are present in anode then find the order of impurities that are coming in solution.

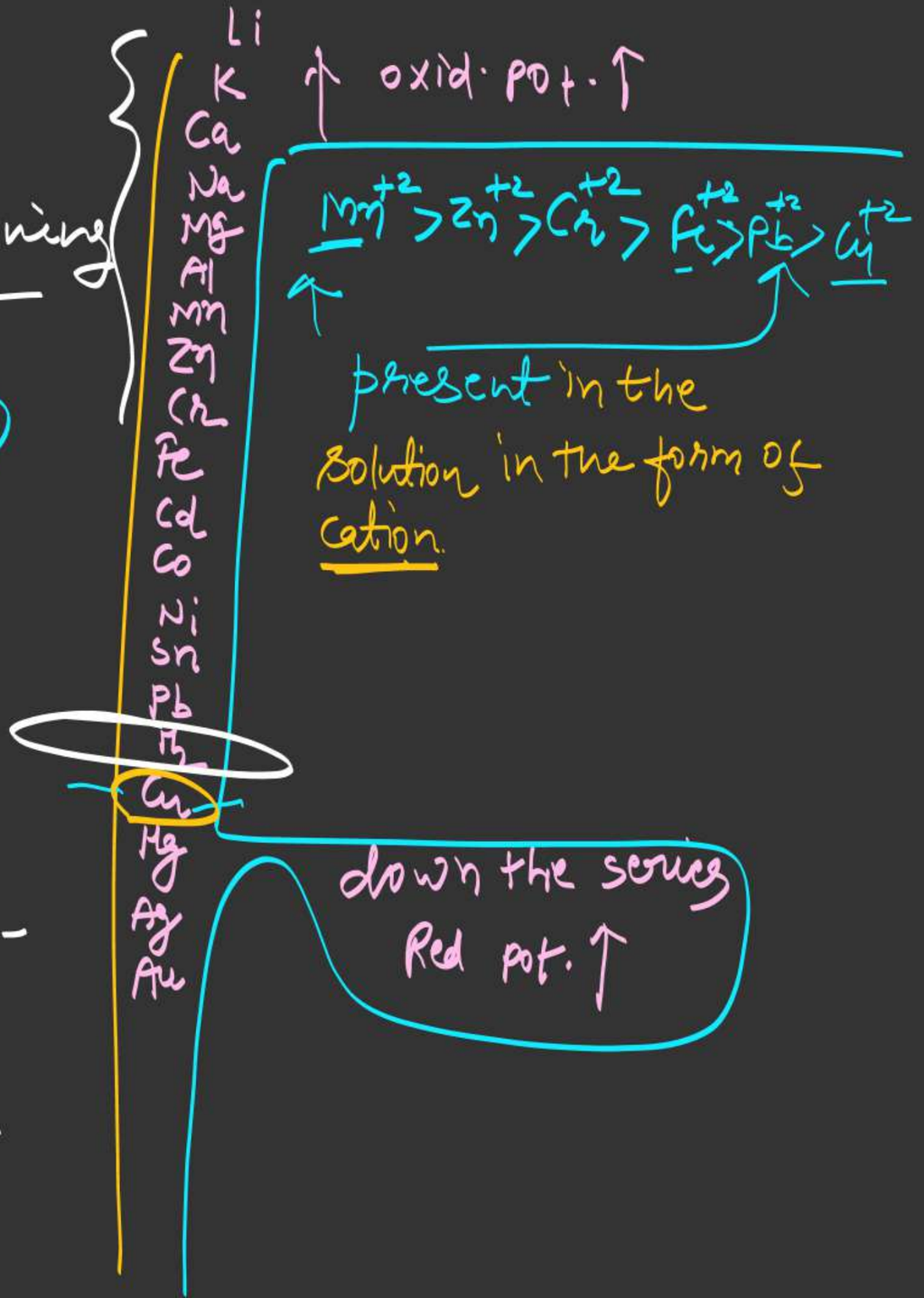
① Electrorefining



anode mud
(Impurity present in the elemental form)

at anode $Cu_{(s)} \longrightarrow Cu^{+2}_{(aq.)} + 2e^-$

at Cathode $Cu^{+2} + 2e^- \longrightarrow Cu$



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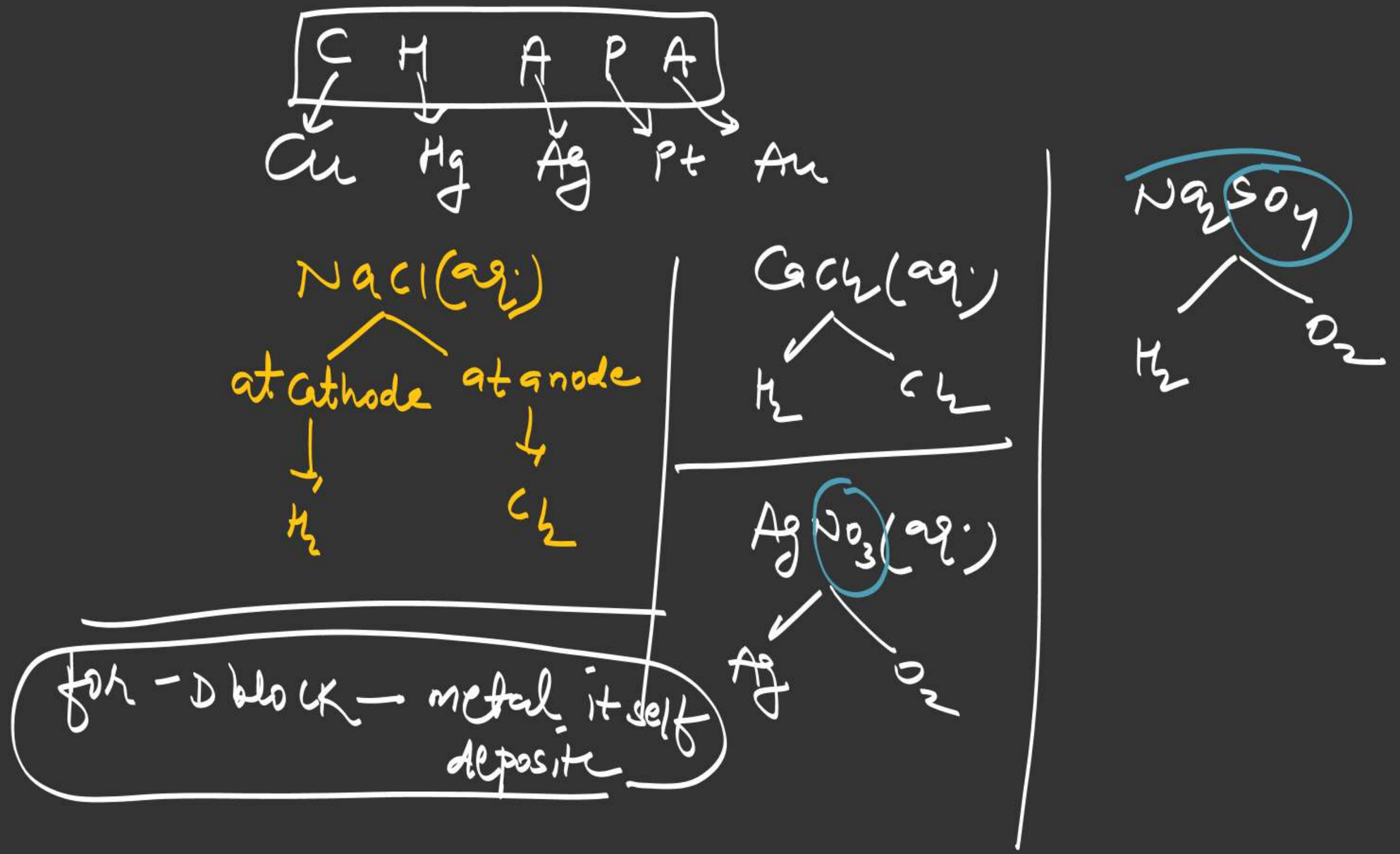

Condition of electrolyte

Oxid. pot. of Metal > oxid. pot. of anion

and if oxid. pot of M^{2-} > oxid. pot of X^-

oxid. pot of M > oxid. pot of Y^-

oxid. pot. of M < oxid. pot. of X^-

then identify electrolysis for electrorefining of metal M

① MX ② MY ③ MZ_2 ④ all of these ⑤ none

anode mud of a Contain impurities of

Au Ag Sb Te Se Pt

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$NaCl \longrightarrow Na^+ + Cl^\ominus$

(Molten)
(fused)

at Cathode

$Na^+ + e^- \longrightarrow Na$

at anode $\rightarrow$ $Cl^- \longrightarrow \frac{1}{2}Cl_2 + e^-$

deposition order

$SO_4^{-2} < NO_3^- < OH^- < Cl^- < Br^- < I^-$

$4OH^- \longrightarrow 2H_2O + O_2$

$NaCl(aq.) \longrightarrow Na^+ + Cl^-$

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

Basic

NaOH

pH > 7

at Cathode

$H^+ + e^- \longrightarrow \frac{1}{2}H_2$

at anode $Cl^\ominus \longrightarrow \frac{1}{2}Cl_2 + e^-$

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H-W

DPP

→ one — learn from DPP

② sheet up to electro refining

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Note ⇒ S-Block element can never be extracted by their aq. solution

Keypoint for aq. solution

at Cathode
- above H_2 → H_2
- below H_2 → Metal itself

at anode
- Polyatomic anion → O_2
- $Cl^-/Br^-/F^-$ → $Cl_2/Br_2/I_2$