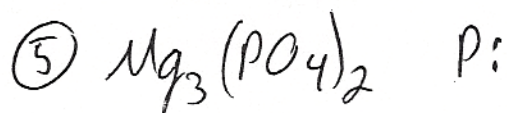
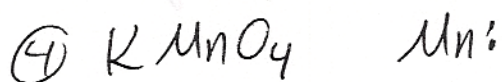
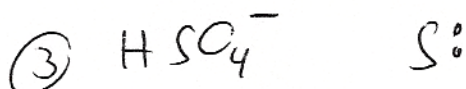
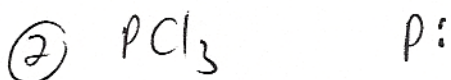
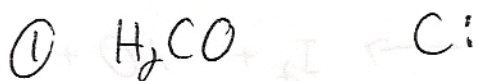
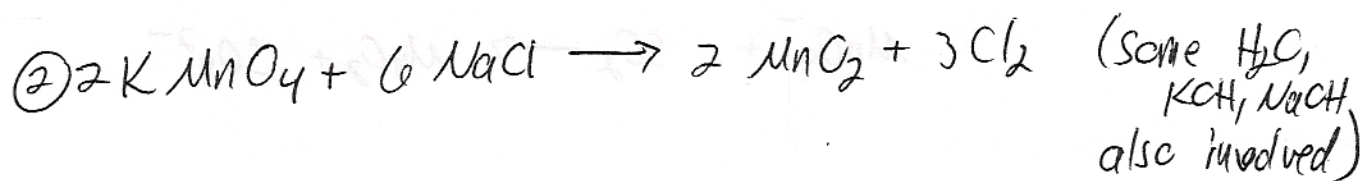
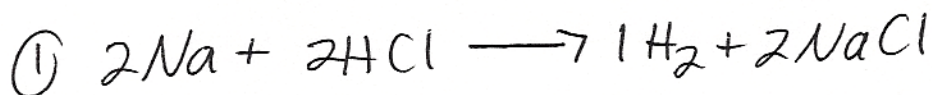


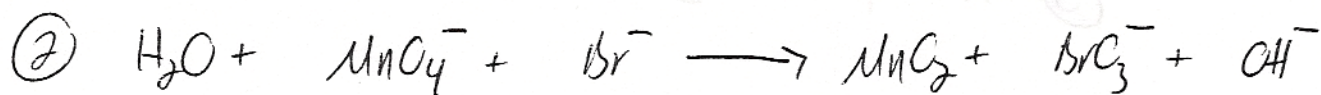
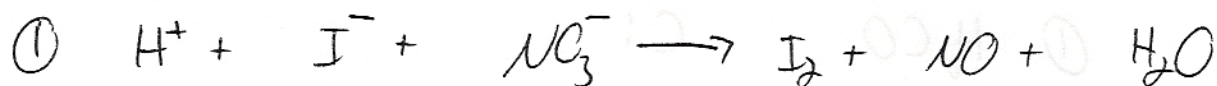
Find Ox #'s for



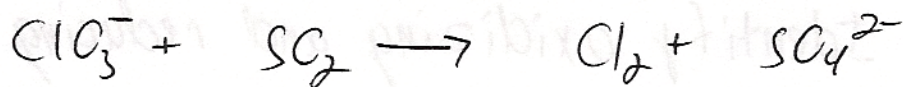
Identify oxidizing and reducing agents



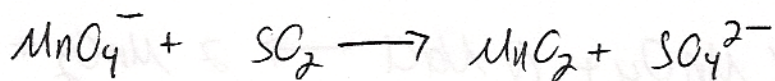
(19-6)

Balance (Test Level)OWL:

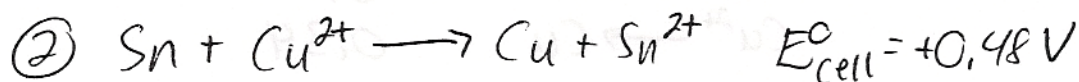
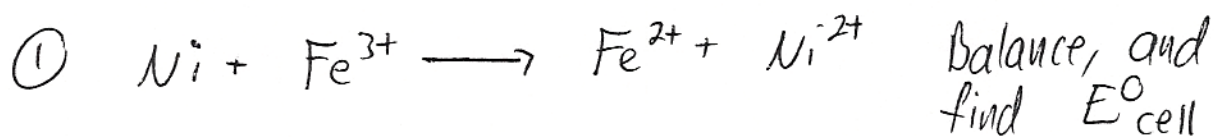
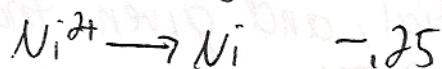
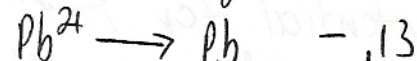
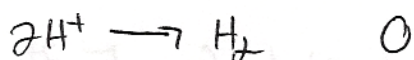
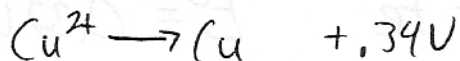
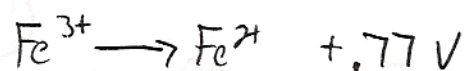
① Acid conditions: balance, adding H_2O 's and H^+ 's as needed



② base: end with H_2O 's, OH^- as needed (long!!)



(19-11)



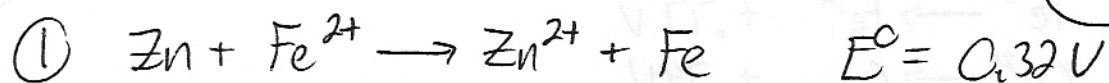
Find E°_{ox} for $\text{Sn} \rightarrow \text{Sn}^{2+}$,
 E°_{red} for $\text{Sn}^{2+} \rightarrow \text{Sn}$

③ Rank the oxidizing agents by strength

④ Rank the reducing agents by strength

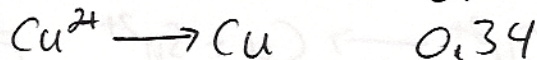
⑤ Which will react with Cu^{2+} ?

⑥ " " Cu^0 ?

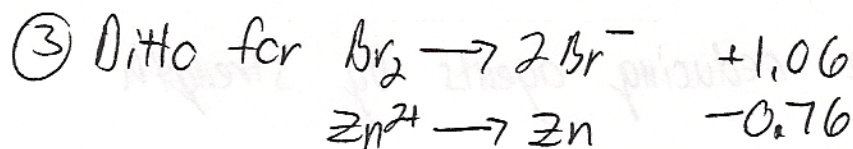


What is the reduction potential for Fe^{2+} ($\text{Fe}^{2+} \rightarrow \text{Fe}^0$) given the above potential, and given that $\text{Zn}^{2+} \rightarrow \text{Zn}$ $E^\circ_{\text{red}} = -0.76$.

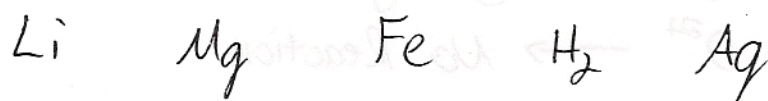
② Find E° for product favored reaction involving the following, and balance the reaction.



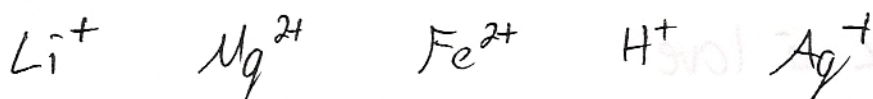
- keep more favorable one as reduction
- reverse less favorable to make it an oxidation
- Sum E°_{ox} and E°_{red}
- adjust coefficients to balance e's



① Predict/Rank E_{ox}° for



② Rank/Predict E_{red}° for



③ Rank F₂ Cl₂ I₂ as oxidizing agents

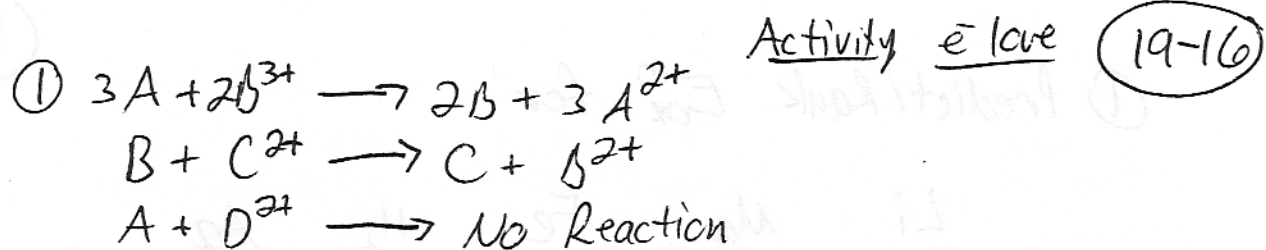
④ F⁻ Cl⁻ I⁻ as reducing agents

⑤ Reduction potentials for Ni²⁺ and Sn²⁺ are -0.25V and -0.16V.

a. which of Ni²⁺ and Sn²⁺ is stronger oxidizing agent?

b. which of Ni and Sn is stronger reducing agent?

c. which of Ni and Sn would react with H⁺?



Rank activity of A, B, C, D

Rank activity of A^{2+} , B^{3+} , C^{2+} , D^{2+}

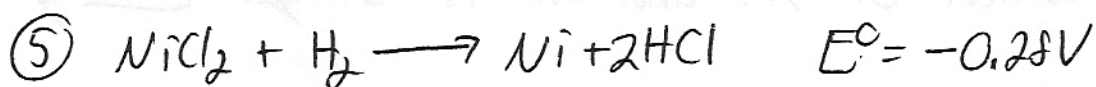
Rank e^- love:

-----	$\downarrow$
$Ag^+ \rightarrow Ag$	+0.80 +0.80
$Cu^{2+} \rightarrow Cu$	+0.34 +0.34
$Zn^{2+} \rightarrow Zn$	-0.76
$Al^{3+} \rightarrow Al$	-1.66
$Mg^{2+} \rightarrow Mg$	-2.36

② Which species react with Cu^{2+} ?

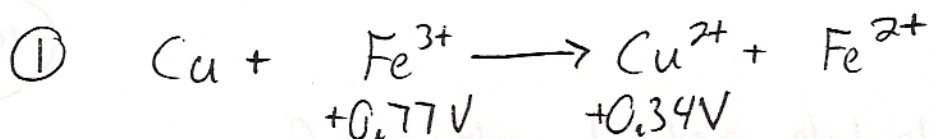
③ which react with Zn^0 ?

④ which element loves e^- most? Least?

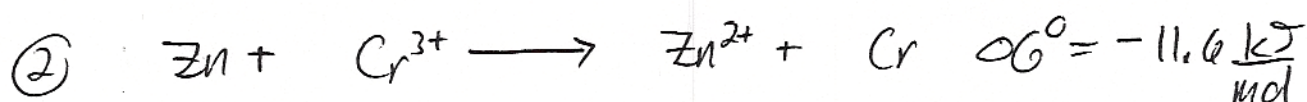


a. Product favored?

b. Is reduction potential for Ni^{2+} positive?

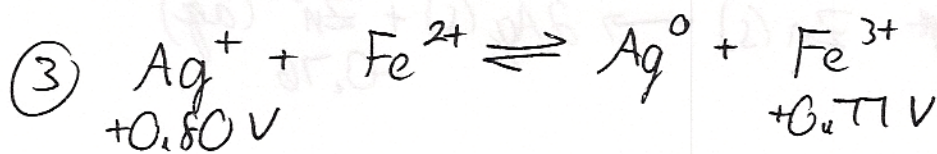


Balance the reaction, and find ΔG° given the reduction potentials shown.



a. Balance the reaction, and calculate E° .

b. If the reduction potential for Zn^{2+} is -0.76V , what is the reduction potential for Cr^{3+} ?



Calculate K , given reduction potentials.

① Calculate actual voltage for
 $\text{Mg} / \text{Mg}^{2+}(0.10 \text{ M}) // \text{Cu}^{2+}(0.001 \text{ M}) / \text{Cu}$

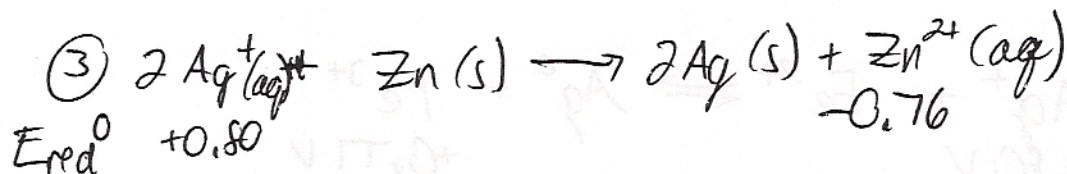
given the following reduction potentials:

$$\begin{array}{ll} \text{Mg}^{2+} & -2.37 \text{ V} \\ \text{Cu}^{2+} & +0.34 \text{ V} \end{array}$$

Logic Steps

② Same for $\text{Cu} / \text{Cu}^{2+}(1.0 \text{ M}) // \text{Ag}^{+}(0.032 \text{ M}) / \text{Ag}$

$$\begin{array}{ll} \text{E}_{\text{red}}^{\circ} & \\ \text{Ag}^{+} & +0.80 \text{ V} \\ \text{Cu}^{2+} & +0.34 \text{ V} \end{array}$$

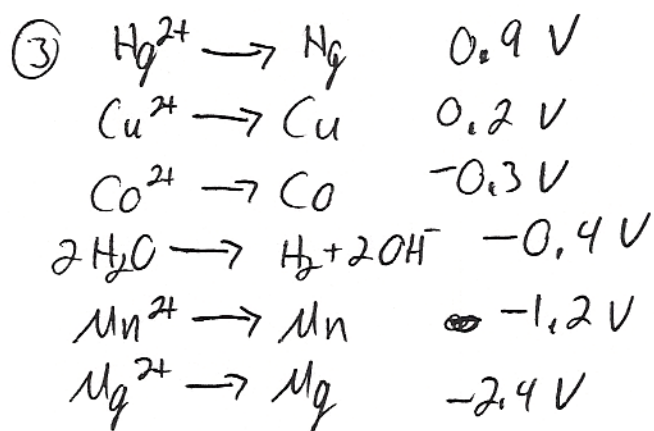


If a cell with $[\text{Ag}^{+}] = 0.20 \text{ M}$ has $E_{\text{actual}} = 1.63 \text{ V}$,
 what is $[\text{Zn}^{2+}]$?

(19-26)

① How many grams of Al (27g/mol) is produced in 1.0 h by electrolysis of AlCl_3 at 10.0 A current?

② At 3.2 A, how long will it take to make 10g of Zn (65.4g/mol) from ZnBr_2 ?



What metals could be formed at ~~anode~~ cathode in water?