

# Chem 30 Electrochem VA pt A KEY!



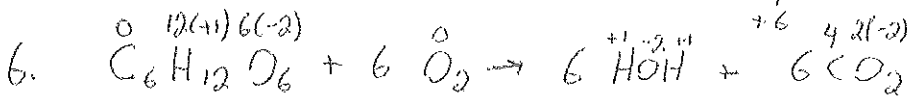
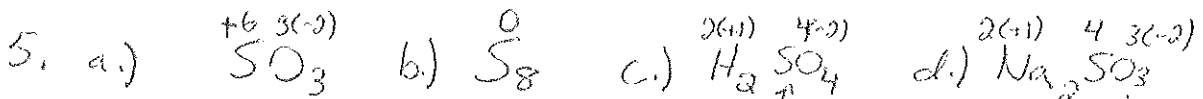
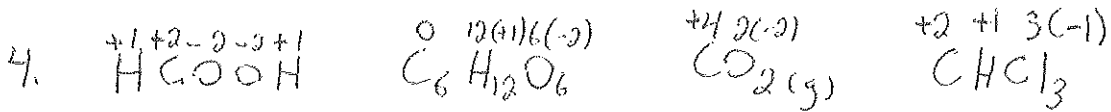
2. a.) Non-spontaneous.

b.) Non-spontaneous

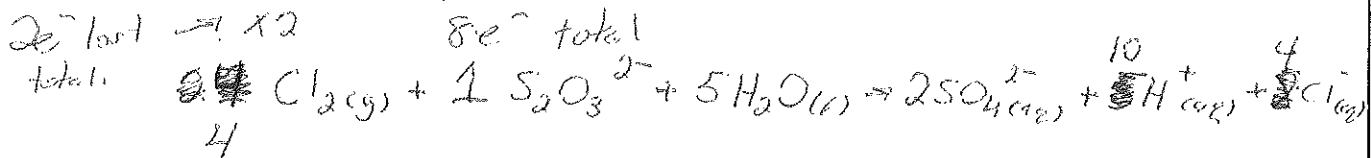
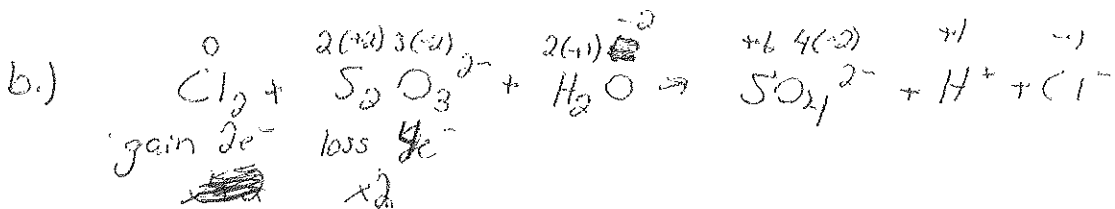
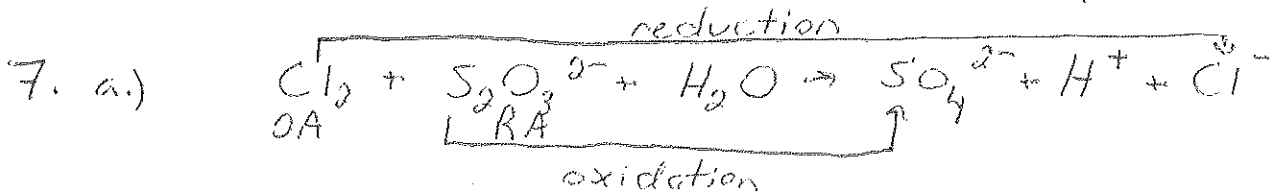
c.) Spontaneous  $\rightarrow \text{Cl}_2(\text{g})$  appears above  $\text{I}^-(\text{aq})$  on the redox table.  $\text{Cl}_2 \rightarrow \text{I}^-$

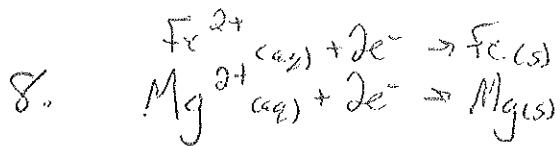
d.) Non-spontaneous

3. d  $\rightarrow \text{Cu}^{2+}(\text{aq})$  and  $\text{Sn}^{4+}(\text{aq})$  are between lead and iodine on the redox table and react spontaneously with them.

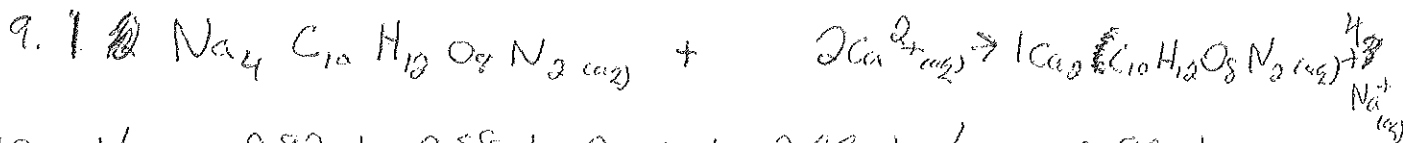


The carbon in glucose increases in oxidation number from 0 to 4 and is therefore oxidized.



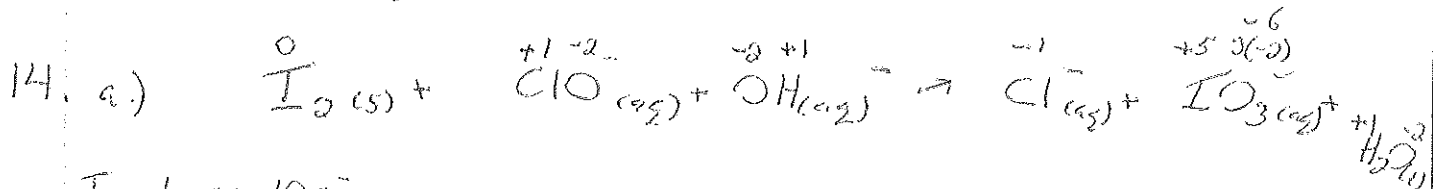
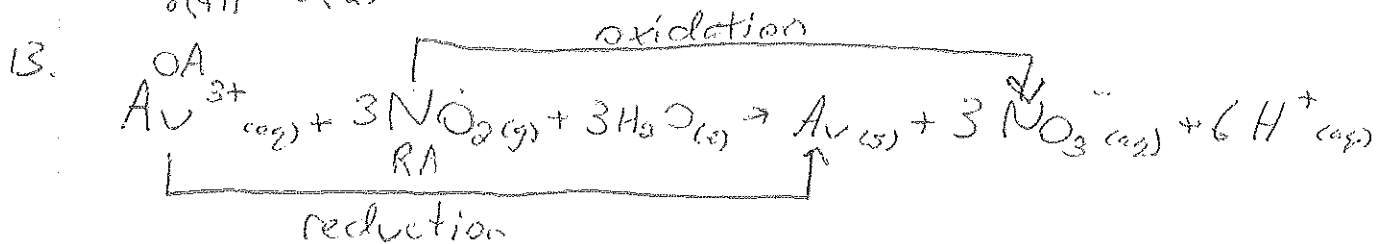
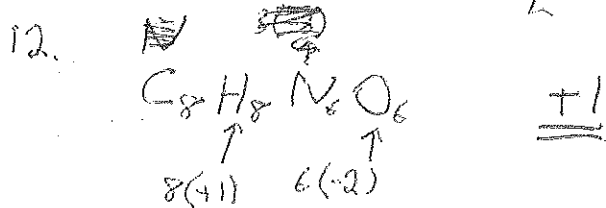


Magnesium is below iron on the redox table and is a better reducing agent. This means it is more likely to react (particularly with oxygen and water) before the iron it protects.

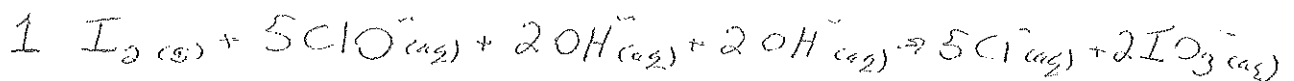


10.  $V_{\text{ave}} = \frac{2.82 \text{ mL} + 2.88 \text{ mL} + 3.03 \text{ mL} + 2.99 \text{ mL}}{4} = \underline{\underline{2.93 \text{ mL}}}$

11.  $0.00293 \text{ L} \times \frac{0.125 \text{ mol}}{\text{L}} \times \frac{2 \text{ unknown}}{1 \text{ known}} = \frac{0.366 \text{ mmol}}{\text{L}} \times 1000 = 366$



$\text{I}_2$  loses  $10\text{e}^-$   
 $\text{Cl}$  gains  $2\text{e}^- \rightarrow$  multiply by 5.

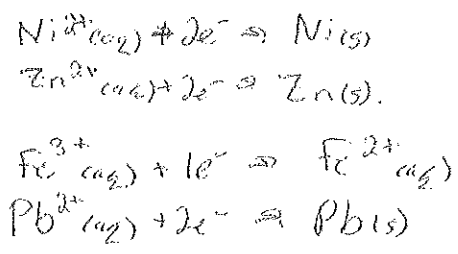


$1.15 \text{ g I}_2 \times \frac{1 \text{ mol}}{253.8 \text{ g I}_2} \times \frac{5 \text{ unknown}}{1 \text{ I}_2} \times \frac{1 \text{ L}}{0.55 \text{ mol}} = \underline{\underline{41.2 \text{ mL}}} + 1 \text{ H}_2\text{O}(\text{l})$

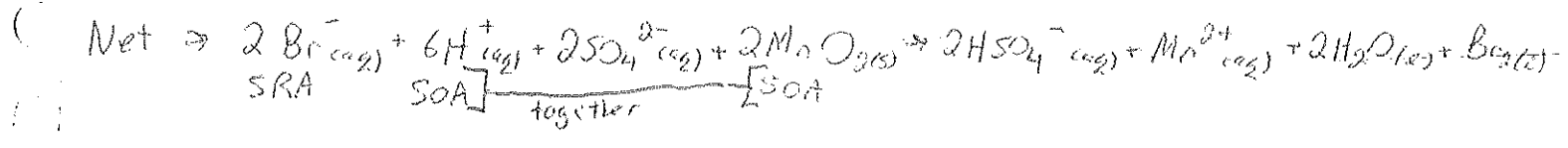
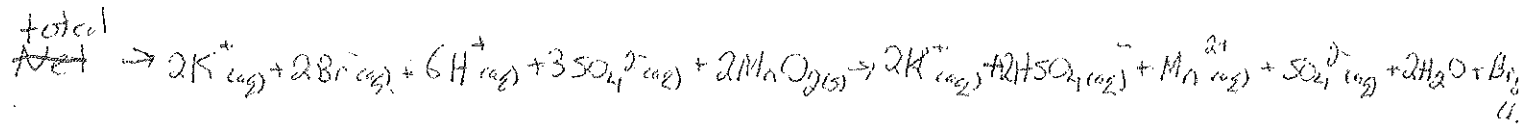
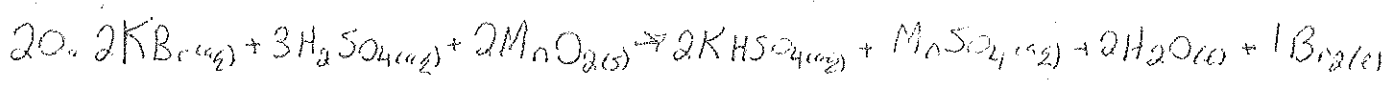
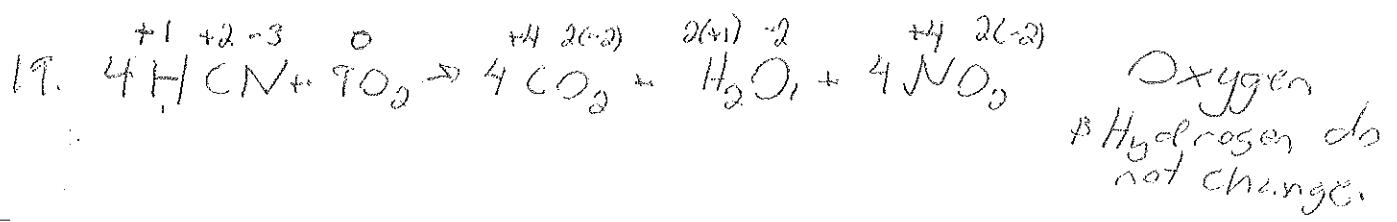
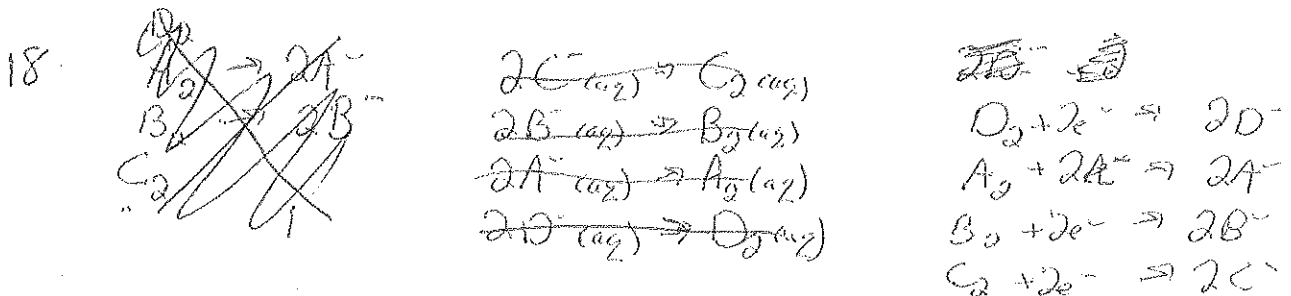
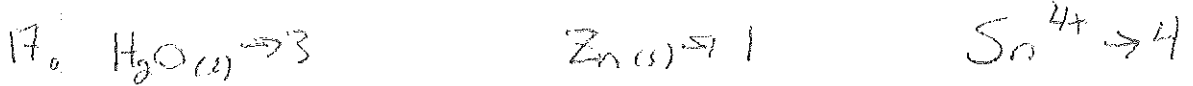
b. The reaction  $\text{OCl}^-(\text{aq}) + \text{H}_2\text{O}(\text{l}) + 2\text{e}^- \rightarrow \text{Cl}^-(\text{aq}) + 2\text{OH}^-(\text{aq})$  is quite high on the REDOX table, making it spontaneous with many  $\text{O}_2$

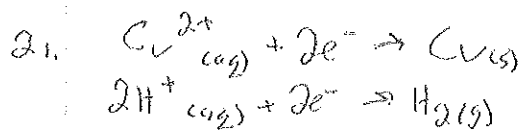
other reactants on the table. For this reason, bleach should be kept away from other chemicals.

- I → No rxn
- II → No rxn
- III → Spontaneous
- IV → Spontaneous
- V → NO rxn

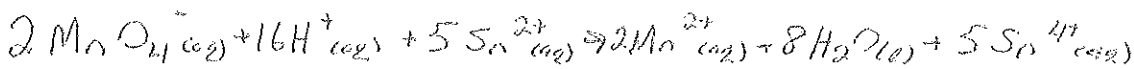
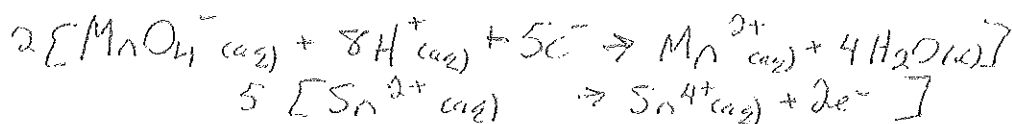
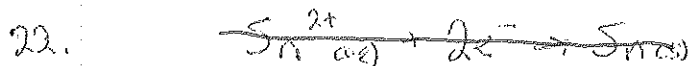


16. Gold is best as Au(s) is such a poor ~~oxidizing agent~~ <sup>reducing agent</sup> that it reacts with very few other chemicals, including H<sup>+</sup>.





As copper metal is above  $H^+(aq)$  on the redox table, no reaction will take place. This is the best metal to choose to avoid reactions in your mouth.



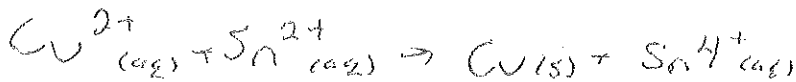
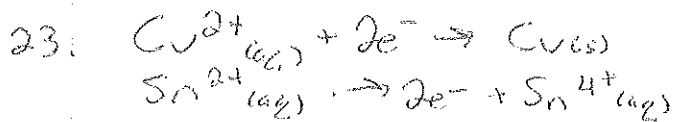
$c = 0.200 \text{ mol/L}$

$c = ?$

$V = 0.040 \text{ L}$

$V = 0.025 \text{ L}$

$\frac{0.200 \text{ mol}}{1 \text{ L}} \times 0.040 \text{ L} \times \frac{5}{2} \times \frac{1}{0.025 \text{ L}} = 0.800 \text{ mol/L}$



24.

