

Name: _____

Period: _____

Seat#: _____

Review if needed: You were supposed to cover this during the AP Summer Assignment and we have occasionally touched on Redox during the year, but since it has been a while here are a few quick things to jog your memory if needed ☺

Quick PowerPoint https://tinyurl.com/63m6psps	Some Worksheets https://tinyurl.com/43xn2kce	Tyler Dewitt Electrochem Videos https://tinyurl.com/kc8py9k7
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Assigning Oxidation Numbers

Determine the oxidation number of the underlined element.

1) $\text{Be}\underline{\text{C}}\text{l}_2$	2) $\text{N}\underline{\text{O}}$	3) $\text{Na}_2\underline{\text{S}}\text{O}_3$	4) $\text{H}_2\underline{\text{O}}_2$
5) $\text{Ag}\underline{\text{B}}\text{r}$	6) $\text{A}\underline{\text{u}}\text{Cl}_3$	7) $\text{H}\underline{\text{N}}\text{O}_3$	8) $\text{H}_2\underline{\text{S}}\text{nO}_3$
9) $\underline{\text{S}}\text{O}_3$	10) $\underline{\text{U}}\text{F}_6$	11) $\text{Ba}\underline{\text{C}}\text{rO}_4$	12) $\text{Ca}\underline{\text{S}}\text{eO}_4$
13) $\text{H}\underline{\text{I}}$	14) $\text{H}_2\underline{\text{S}}\text{e}$	15) $\text{K}_2\underline{\text{P}}\text{tCl}_6$	16) $\underline{\text{N}}\text{iSO}_4$
17) $\underline{\text{N}}\text{H}_3$	18) $\text{H}\underline{\text{C}}\text{lO}$	19) $\underline{\text{N}}\text{H}_4\text{Cl}$	20) $(\text{NH}_4)_2\underline{\text{T}}\text{e}$

The Half Reaction Method

1. Write the two half-reactions. Include the atoms/ions/molecules that are involved in change of oxidation state.
2. Balance each half-reaction with respect to atoms and charges.
 - a. First balance atoms other than H and O
 - b. Then balance O by adding H_2O
 - c. Next balance H by adding H^+
(if in basic solution, you have to add OH^- to each side for each of the H^+ . Remember, $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$)
 - d. Last, balance the charge by adding electrons e^- .
3. Equalize the number of electrons lost in the oxidation half-reaction with the number of electrons gained in the reduction half-reaction by multiplying one or both of the reactions by a whole number. You are looking for that "least common multiple" between the two reactions.
4. Add the two half-reactions to form a balanced net ionic equation. Don't forget to combine like terms on each side and to cancel out things that show up on both sides.

**Use binder paper if you need to work through each more stepwise! These can be tough! Lots to keep track of!*

1) $\text{HCl} + \text{K}_2\text{Cr}_2\text{O}_7 \rightarrow \text{KCl} + \text{CrCl}_3 + \text{Cl}_2$	<i>*Its ok if you did compounds in a different order! 14, 1, 2, 2, 3, 7H₂O</i>
Reduction Half-Reaction	Oxidation Half-Reaction
Overall finished balanced redox reaction:	

Dougherty Valley HS Chemistry - AP
Electrochemistry – Oxidation and Reduction

2) $\text{FeCl}_2 + \text{KMnO}_4 + \text{HCl} \rightarrow \text{FeCl}_3 + \text{KCl} + \text{MnCl}_2 + \text{H}_2\text{O}$ <u>5, 1, 8, 5, 1, 1, 4H₂O</u>	
Reduction Half-Reaction	Oxidation Half-Reaction
Overall finished balanced redox reaction:	

3) $\text{CuS} + \text{NO}_3^- \rightarrow \text{Cu}^{2+} + \text{S} + \text{NO}$ <u>3, 2, 8H⁺, 3, 3, 2, 4H₂O</u>	
Reduction Half-Reaction	Oxidation Half-Reaction
Overall finished balanced redox reaction:	

4) $\text{HNO}_3 + \text{S} \rightarrow \text{NO}_2 + \text{H}_2\text{SO}_4 + \text{H}_2\text{O}$ <u>6, 1, 6, 1, 2H₂O</u>	
Overall finished balanced redox reaction:	

5) $\text{KMnO}_4 + \text{HCl} + \text{H}_2\text{S} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{S}$ <u>2, 6, 5, 2, 2, 5, 8H₂O</u>	
Overall finished balanced redox reaction:	

6) $\text{FeCl}_3 + \text{H}_2\text{S} \rightarrow \text{FeCl}_2 + \text{HCl} + \text{S}$ <u>2, 1, 2, 2, 1</u>	
Overall finished balanced redox reaction:	

7) $\text{Cu} + \text{HNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{NO}_2$ <u>1, 4, 1, 2, 2H₂O</u>	
Overall finished balanced redox reaction:	