

# unit 10: Hydrogen

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Chem 30A: Solutions to end of chapter Problems not listed in text.

## Chapter 8:

11. see text

12. see text

14. see text

22. a. oxidizing agent:  $\text{Cl}_2$  reducing agent:  $\text{Br}^-$

b. skip

24. a. oxidizing agent:  $\text{Ag}^+$  reducing agent:  $\text{Cu}$

b. oxidizing agent:  $\text{Cu}^{2+}$  reducing agent:  $\text{Zn}$

26. a.  $3\text{Ag}^+(\text{aq}) + 3\text{e}^- \rightarrow 3\text{Ag}(\text{s})$  reduction  
 $\text{Al}(\text{s}) \rightarrow \text{Al}^{3+}(\text{aq}) + 3\text{e}^-$  oxidation

note: same # of  $\text{e}^-$  reduced as oxidized

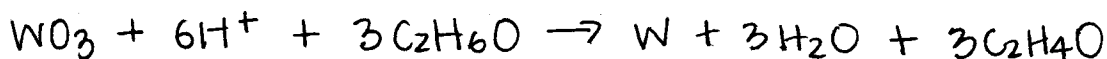
b.  $6\text{H}^+(\text{aq}) + 6\text{e}^- \rightarrow 3\text{H}_2(\text{g})$  reduction  
 $2\text{Al}(\text{s}) \rightarrow 2\text{Al}^{3+}(\text{aq}) + 6\text{e}^-$  oxidation

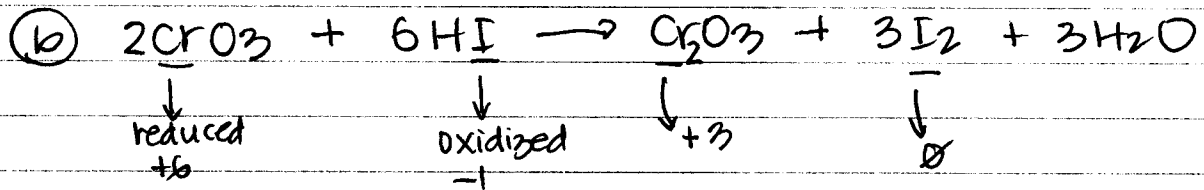
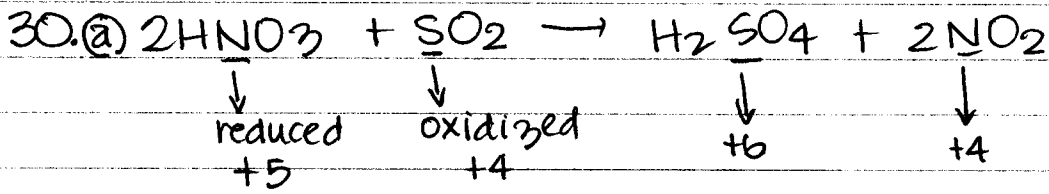
28. a.  $2\text{H}_2\text{O}_2 \rightarrow 2\text{O}_2 + 4\text{H}^+ + 4\text{e}^-$  oxidation  
 $4(\text{Fe}^{3+} + \text{e}^- \rightarrow \text{Fe}^{2+})$  reduction

overall equation:  $2\text{H}_2\text{O}_2 + 4\text{Fe}^{3+} \rightarrow 2\text{O}_2 + 4\text{H}^+ + 4\text{Fe}^{2+}$

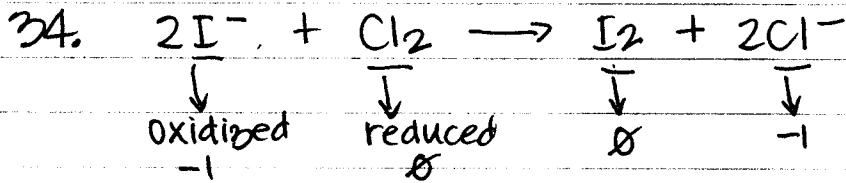
b.  $\text{WO}_3 + 6\text{H}^+ + 6\text{e}^- \rightarrow \text{W} + 3\text{H}_2\text{O}$  reduction  
 $3(\text{C}_2\text{H}_6\text{O} \rightarrow \text{C}_2\text{H}_4\text{O} + 2\text{H}^+ + 2\text{e}^-)$  oxidation

overall equation:





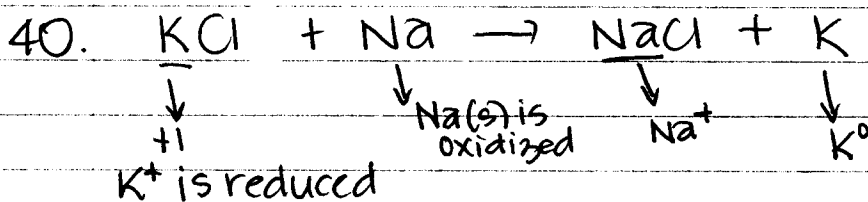
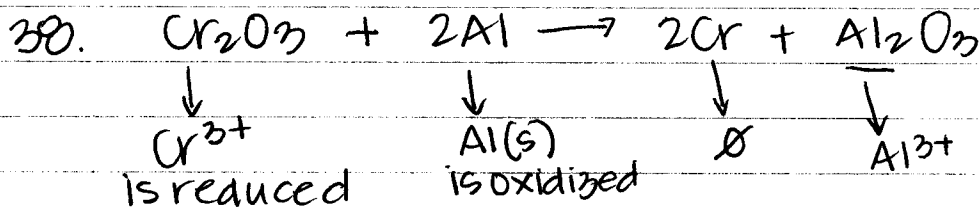
32. skip



36. skip

38. skip

Chapter 11:



42. skip