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Date: May 4 2010

BLK:

Oxidation-Reduction Worksheet 1

1. Identify the following in the reaction: $2\overset{+2}{\text{Fe}}^{2+} + \overset{0}{\text{Cl}}_2 \rightarrow 2\overset{+3}{\text{Fe}}^{3+} + 2\overset{-1}{\text{Cl}}^{-}$ (4 marks)

a. The oxidizing agent	Cl_2	e. The species gaining electrons	Cl_2
b. The species being oxidized	Fe^{2+}	f. The species losing electrons	Fe^{2+}
c. The reducing agent	Fe^{2+}	g. The product of oxidation	Fe^{3+}
d. The species being reduced	Cl_2	h. The product of reduction	Cl^{-}

2. Use the Standard Reduction Table to answer the following. (4 marks)

a. Will Br_2 oxidize $\text{Au}_{(s)}$? Explain. Yes, Br_2 is higher on the table as an oxidizing agent than $\text{Au}_{(s)}$ as a reducing agent

b. Give the symbol of an ion that will oxidize $\text{Mn}_{(s)}$ but not $\text{Cr}_{(s)}$. Zn^{2+}

c. Which is a stronger reducing agent, Sn^{2+} or Fe^{2+} ? Sn^{2+}

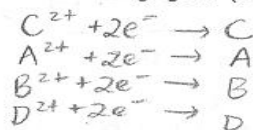
d. Can you safely put a gold ring in acidified dichromate solution? What about acidified bromate solution?

Explain. $\text{Au}_{(s)}$ is higher on the table as a reducing agent than $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+$ as an oxidizing agent, so it will not react. $\text{Au}_{(s)}$ will not react with $\text{BrO}_3^- + 6\text{H}^+$ either for same reason

3. Four metals A, B, C, & D were tested with separate solutions of A^{2+} , B^{2+} , C^{2+} & D^{2+} . Some of the results are summarized in the following table:

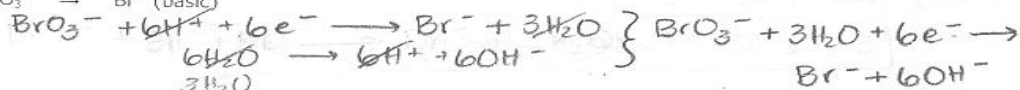
Metal	Solution			
	A^{2+}	B^{2+}	C^{2+}	D^{2+}
A		(1) no reaction	(2) reaction	
B				(4) no reaction
D	(3) reaction			

List the ions in order from the strongest to weakest oxidizing agent. (2 marks)

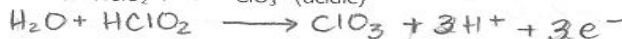


4. Balance the following half reactions. (3 marks)

a. $\text{BrO}_3^- \rightarrow \text{Br}^-$ (basic)



b. $\text{HClO}_2 \rightarrow \text{ClO}_3^-$ (acidic)



c. $\text{Ga} \rightarrow \text{H}_2\text{GaO}_3^-$ (basic)

