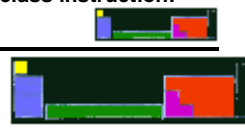


Revised August 2009



HONORS LAB 14a: Predicting REDOX reactions

Aim To make predictions about, and then observe, a number of REDOX reactions

Apparatus Spot plate, pipets

Chemicals Copper (II) chloride solution, magnesium metal, copper metal, iron metal, hydrochloric acid, magnesium chloride solution, iron (III) chloride solution, steel wool.

Method

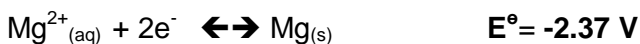
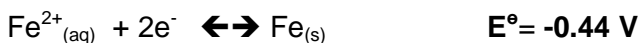
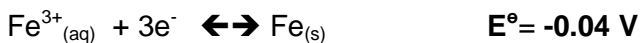
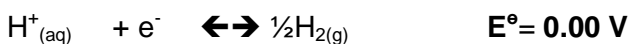
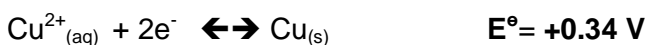
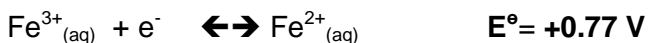
PART A – Make your predictions.

Fill in the table on page 2.

PART B – Perform the experiment.

1. Clean three pieces of copper metal with steel wool, wipe them with a paper towel and place them into each of three wells on the spot plate.
2. Using a pipet, add enough HCl to cover the copper in the first well. Cover the copper in the second well with $MgCl_2$ and the copper in the third well with $FeCl_3$. Observe any evidence of chemical changes (e.g. bubbles, change of color etc.). **RECORD your observations in the results table.**
3. Repeat steps #1 and #2 using magnesium metal in clean wells on the spot plate with acid, $CuCl_2$ and $FeCl_3$ solutions.
4. Repeat steps #1 and #2 using iron metal in clean wells on the spot plate with acid, $CuCl_2$ and $MgCl_2$ solutions.

DATA



Revised August 2009



Predictions

	Cell diagram, assuming reaction occurs	E°_{cell} for reaction	Prediction
$\text{Cu}_{(s)} + \text{H}^{+}_{(aq)}$	$\text{Cu}_{(s)} \text{Cu}^{2+}_{(aq)} \text{H}^{+}_{(aq)} \frac{1}{2}\text{H}_{2(g)} (\text{Pt})$	$= 0.00 - + 0.34 = - 0.34\text{V}$	Negative E°_{cell} therefore no reaction
$\text{Mg}_{(s)} + \text{H}^{+}_{(aq)}$			
$\text{Fe}_{(s)} + \text{H}^{+}_{(aq)}$			
$\text{Mg}_{(s)} + \text{Cu}^{2+}_{(aq)}$			
$\text{Mg}_{(s)} + \text{Fe}^{3+}_{(aq)}$			
$\text{Fe}_{(s)} + \text{Cu}^{2+}_{(aq)}$			
$\text{Fe}_{(s)} + \text{Mg}^{2+}_{(aq)}$			
$\text{Cu}_{(s)} + \text{Fe}^{3+}_{(aq)}$			
$\text{Cu}_{(s)} + \text{Mg}^{2+}_{(aq)}$			

Revised August 2009



Results Record your observations in the table below.

Metals	Solutions			
	HCl	CuCl ₂	MgCl ₂	FeCl ₃
Cu				
Mg				
Fe				

Revised August 2009



Conclusion/Calculation In the table below write chemical **equations**.

1. Write equations for any reactions you observe. If there is no reaction indicate so.

Metals	Solutions			
	HCl	CuCl ₂	MgCl ₂	FeCl ₃
Cu				
Mg				
Fe				

2. Are there any combinations that contradicted your predictions? If so, offer explanations.