

Name: _____
100 points
Dr. Jay H. Baltsberger

Test 2
Chemistry 121A
October 27, 1993

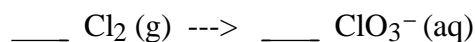
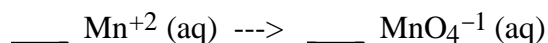
**SHOW ALL CALCULATIONS, CIRCLE YOUR FINAL ANSWERS AND
USE PROPER SIGNIFICANT FIGURES AND UNITS**

1. Determine the oxidation state of the requested element in each of the following compounds and ions. (9 points)

<u>Compound/Ion</u>	<u>Oxidation State</u>
Carbon in CH_2Cl_2	_____
Chromium in $\text{Cr}_2\text{O}_7^{2-}$	_____
Nitrogen in NO_2	_____

2. Calculate the number of moles of oxygen in 55.32 pounds of NaClO_4 . (1 pound = 453.9 g, 5 points)

3. Write the balanced half-reaction equation for the following two unbalanced reactions in acidic solution, remember to add H_2O , H^+ and e^- as needed to these equations. Also identify whether each reaction is an oxidation reaction or a reduction reaction. (10 points)



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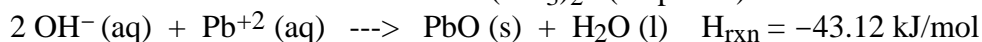
4. Calculate the amount of heat (in kJ) needed to raise 12.8 g of ice from -45.0°C to water at 5.0°C . (The specific heat of water is $4.18\text{ J/g }^{\circ}\text{C}$ and ice is $2.09\text{ J/g }^{\circ}\text{C}$, while the heat of vaporization for water is 2443 J/g and the heat of fusion is 333 J/g . 15 points)

5. Complete the following table of ionic compounds and empirical formulas and determine whether each compound is soluble in H_2O (16 points):

<u>Empirical Formula</u>	<u>Name</u>	<u>Solubility</u>
K_2CO_3	_____	_____
$\text{Ca}(\text{ClO}_3)_2$	_____	_____
_____	magnesium chromate	_____
_____	aluminum (III) phosphate	_____

6. Write the net ionic equation for the exchange reaction between $\text{Cd}(\text{NO}_3)_2$ and Na_2S . (10 points)

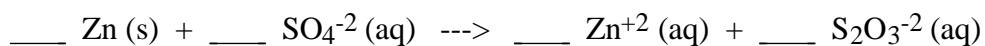
7. Given the reaction below, calculate (in kJ) the amount of heat that will be released when 5.32 L of 0.13 M NaOH reacts with 3.22 L of 0.33 M $\text{Pb}(\text{NO}_3)_2$. (15 points)



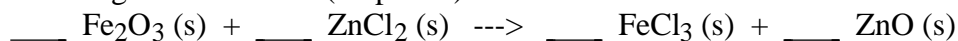
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8. Balance the following reduction/oxidation reactions in acidic conditions, remember to add H₂O and H⁺ to these equations as needed. (10 points each)



9. Balance the following exchange reaction and calculate the mass (in g) of zinc oxide which may be formed from 11.3 g of iron oxide. (10 points)



10. BONUS QUESTION: Write the net ionic reaction for and calculate the volume (in ml) of 0.210 M HCl needed to titrate a solution of 632 ml of 0.0163 M Ca(OH)₂ to the equivalence point. (5 points)