

Chemistry 105-Fundamental Chemistry
Quiz 3-Wednesday, 19 November 1997

Name _____
Laboratory Section _____
ID Number _____

PLEASE ANSWER IN THE SPACE PROVIDED. SHOW **ALL** WORK WHEREVER POSSIBLE- ESPECIALLY STOICHIOMETRIC FACTORS, CHEMICAL EQUATIONS, AND UNIT CONVERSIONS. THERE WILL BE ABSOLUTELY NO TALKING DURING THIS EXAM PERIOD. IF YOU HAVE A QUESTION, RAISE YOUR HAND. IF YOU FINISH EARLY, BRING YOUR EXAM TO ME AND LEAVE QUIETLY. DURING THE LAST TEN MINUTES OF THE EXAM PERIOD, DO NOT LEAVE YOUR SEAT AND DO NOT SPEAK TO OTHERS UNTIL ALL PAPERS HAVE BEEN COLLECTED. INITIAL EACH PAGE SO THAT IF THE PAGES BECOME SEPARATED I CAN PIECE YOUR EXAM BACK TOGETHER. USE A PEN. FILL YOUR STUDENT ID NUMBER IN THE SPACE PROVIDED. GOOD LUCK.

Selected equations, constants, and information:

$M_1V_1=M_2V_2$, $1J = 1 \text{ kg m}^2 \text{ s}^{-2}$, 4 qts = 1 gal, 1.057 qts = 1L, 4.184 J = 1 cal, 2.54 cm = 1 in, 2000 lbs = 1 ton, 5280 ft = 1 mile, 453.6g = 1.00lb, 12 = dozen, 101.325 kps = 1 atm, 1.00 troy oz. = 1.10 avoirdupois [ordinary] oz., 16.0 avoirdupois oz. = 1.00 avoirdupois pound, $R=0.08206 \text{ L atm/K mol}$, $1 \text{ atm}=29.92 \text{ in}=760 \text{ torr}=760 \text{ mm Hg}$, $C=q/ T$, $-q=q$, $4.184 \text{ J/g}\cdot\text{K}$

Soluble compounds	Insoluble compounds
compounds of Group 1 elements	carbonates, chromates, and phosphates, except those of the Group 1 elements and NH_4^+
ammonium compounds	
chlorides, bromides, and iodides, except those of Ag^+ , Hg_2^{2+} , and Pb^{2+} *	sulfides, except those of the Group 1 and 2 elements and NH_4^+
nitrates, acetates, chlorates, and perchlorates	hydroxides and oxides, except those of the Group 1 and 2 elements**
sulfates, except those of Ca^{2+} , Sr^{2+} , Ba^{2+} , Pb^{2+} , Hg_2^{2+} , and Ag^{+} ***	

* PbCl_2 is slightly soluble.

** $\text{Ca}(\text{OH})_2$ and $\text{Sr}(\text{OH})_2$ are sparingly (slightly) soluble; $\text{Mg}(\text{OH})_2$ is only very slightly soluble.

*** Ag_2SO_4 is slightly soluble.

1. (5 pts) Place the most appropriate term in the space provided.

Heat transfers are measured with a _____, an insulated container fitted with a _____. If heat is given off by a reaction, the reaction is termed _____ and if heat is absorbed it is termed _____. Consequently, the value of H , known as the _____, will be either negative or positive, respectively.

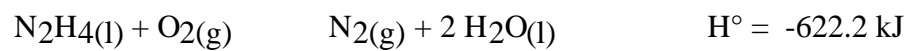
2. How much heat in kilojoules is required to raise the temperature of 20.0 g of water from 20.0 °C to 96.0 °C

3. The oxidation of nitrogen occurs in jet engines according to the following equation:



If the above reaction were carried out in a bomb calorimeter and 790 J of energy were absorbed, how many grams of nitrogen gas were reacted?

4. (10pts) Use the following equations



to calculate the reaction enthalpy for the reaction

