

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 QUIZ 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 QUIZ 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 QUIZ BACK TOGETHER. USE A PEN. FILL YOUR STUDENT ID NUMBER IN THE SPACE PROVIDED. GOOD LUCK.

Selected equations, constants, and information:

$M_1 V_1 = M_2 V_2$, $1 \text{ J} = 1 \text{ kg m}^2 \text{ s}^{-2}$, 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, $R=0.08206 \text{ L atm/K mol}$, $1 \text{ atm}=29.92 \text{ in}=760 \text{ torr}=760 \text{ mm Hg}$, $C=q/ T$, $-q=q$, sp heat for water= $4.184 \text{ J/g}\cdot\text{K}$

Soluble compounds	Insoluble compounds
compounds of Group 1 elements	carbonates, chromates, and phosphates, except
ammonium compounds	those of the Group 1 elements and NH_4^+
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.

3. (5 pts) The vaporization of 0.235 mol of liquid methane requires 1.93kJ of heat. Calculate the heat of vaporization for methane.

4. (10 pts) Combustion of 0.144 g of sucrose (table sugar, $C_{12}H_{22}O_{11}$) results in the release of 2.38 kJ of heat according to the chemical reaction:



Calculate the enthalpy of reaction for the combustion of sucrose.