

Name: _____

ID: _____ - _____ - _____

The Periodic Table

IA H 1 1.01																	VIII A He 2 4.00
II A Li 3 6.94	Be 4 9.01											III A B 5 10.81	IV A C 6 12.01	V A N 7 14.01	VI A O 8 16.00	VII A F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31			III B Al 13 26.98	IV B Si 14 28.09	V B P 15 30.97	VI B S 16 32.07	VII B Cl 17 35.45	VIII B Ar 18 39.95								
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 (263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)									

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11

Solubility Guidelines:

Soluble Ionic Compounds	
1.	All sodium, potassium and ammonium salts are soluble.
2.	All nitrate, acetate, chlorate and perchlorate salts are soluble
3.	All chloride, bromide and iodide salts are soluble. Except those that contain: lead, silver or mercury(I) (Hg_2^{2+}).
4.	All fluoride salts are soluble. Except those that contain: magnesium, calcium, strontium, barium or lead.
5.	All sulfate salts are soluble. Except those that contain: calcium, silver, mercury(I), strontium, barium or lead.
Not Soluble Ionic Compounds	
1.	All hydroxide and oxide salts are not soluble. Except those that contain: sodium, potassium or barium.
2.	All sulfide salts are not soluble. Except those that contain: sodium, potassium ammonium or barium.
3.	All carbonate and phosphate salts are not soluble. Except those that contain: sodium, potassium or ammonium.

Useful Information

- ΔH_f° : $\text{C}_3\text{H}_8(\text{g}) = -103.8 \text{ kJ}\cdot\text{mol}^{-1}$ $\text{CO}_2(\text{g}) = -393.5 \text{ kJ}\cdot\text{mol}^{-1}$ $\text{H}_2\text{O}(\text{g}) = -241.8 \text{ kJ}\cdot\text{mol}^{-1}$
- $PV = nRT$ $R = 0.08205 \text{ L}\cdot\text{atm}\cdot\text{K}^{-1}\cdot\text{mol}^{-1}$

Question 1 0.2 mol of phosgene was combusted in a bomb calorimeter after which the temperature of the bomb and the water increases by 5.47°C . The heat capacity of water is $4.184 \text{ J/g}^{\circ}$, the calorimeter constant is 650 J° and the calorimeter contained 320 g of water. What is the heat of combustion per mole of phosgene?
8 Points

Question 2 A 150 g piece of metal at 80°C is placed in 150 g of water at 20°C . When they both reach thermal equilibrium the temperature is found to be 23.3°C . What is the specific heat of the metal?
8 Points
[Specific Heat of Water = $4.184 \text{ J/g}^{\circ}$]

Question 3 Use the following reactions

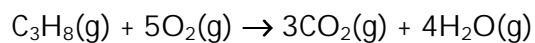
6 Points



to determine the enthalpy of reaction for the formation of lead(II) chloride from lead and chlorine.

Question 4 Use standard heats of formation to determine how much energy is released when 10.0 g of propane is burned.

6 Points



Question 5 Write the balanced chemical equation and the net ionic equation for the reaction that occurs between each of the following

12 Points

Potassium hydroxide and hydrochloric acid:

Chemical Eq.

N.I.E.

Nitric acid and iron(II) carbonate:

Chemical Eq.

N.I.E.

Sodium phosphate and copper(II) nitrate:

Chemical Eq.

N.I.E.

Question 6 Three unlabelled bottles are known to contain aqueous solutions of NaCl, $\text{Pb}(\text{NO}_3)_2$ and NH_4Br . How could you quickly identify one of the solutions?
4 Points

Question 7 HCN is a weak acid. Write the net ionic equation for the reaction that occurs between HCN and sodium hydroxide?
4 Points

Question 8 If equal mass quantities of CO_2 , Ne and H_2 are placed in containers of equal volume at the same temperature. Then the order in order of increasing partial pressure would be:
(you may assume Ideal Gas Behavior)
9 Points

_____ _____ _____
Least Pressure Greatest pressure

Question 9 53.8 mL of 1.82 M hydrobromic acid is added to 23.0 mL of potassium hydroxide, and the resulting solution is found to be acidic. 29.3 mL of 0.911 M calcium hydroxide is required to reach neutrality. What is the molarity of the original potassium hydroxide solution?
10 Points

Question 10 C_5H_{12} reacts with O_2 to produce H_2O and CO_2 . How many grams of H_2O (MM= 18.0g/mol) are produced when 0.402 moles of C_5H_{12} reacts with 1.53 moles of O_2 ?

6 Points