Feb 20, 2013

Print name _____

Sign name _____ circle registration section below _____

CIRCLE your recitation section in the list below.

Section	A	Fri 10 am, Aiqin Fang	B	Fri 11 am, Aiqin Fang
	C	Tue 3 pm, Rahul Jain	D	Tue 1 pm, Rahul Jain
	F	W 10 am, Neeraj Kumar	G	Wed 2 pm, Rahul Jain

Cell phones, PDAs, mp3 players, and other electronic devices must be turned off and stowed out of sight (your sight and mine). Calculator policy is in effect. Infractions will result in confiscation and point deductions.

Please clearly and legibly write your name, in ink, at the top of every page. Your score will not be recorded and your exam will not be returned if this is not done.

All answers should be rounded to the appropriate precision (correct significant figures.)

Atomic weights are provided in the Periodic Table. These values must be used.

You may not use any outside paper. If you reach a point where you need more scratch paper than the space available on this page and on the back of your exam, ask a proctor.

Be certain your answers are clear. If an answer is not clear, it will probably be considered wrong.

Problems marked with ** in the margin are directly from the assigned homework (either in the text or on worksheets in class).

Use your time effectively. **Time is up at 8:50!!**

name_____

Scored grade (instructor use only!)_____

1. [2 pts each] **Clearly** assign each statement as TRUE or FALSE. If we can't tell which you mean, it's wrong.

_____A solution of 0.1 M magnesium chloride has chloride ion concentration 0.2 M.

_____In a balanced equation, the number of molecules must be the same in the reactants and products.

_____When ionic compounds dissolve in water, they always dissociate.

_____When covalent compounds dissolve in water, they never dissociate.

_____Water molecules have an uneven distribution of charge.

_____**Ammonia dissociates completely when dissolved in water.

_____**H_2O never appears in a net ionic equation.

_____**When $HClO_4$ dissolves in water, the dissociation is complete and the reverse reaction (back to neutral molecules) does not occur.

_____The reaction of HCl with Na_2CO_3 produces CO_2 (g).

_____Oxygen always has an oxidation number of -1 in compounds.

2. [4 pts] Calculate the number of sodium ions in 2.11 mol of sodium phosphide. Write your answer (with the appropriate precision) in the space.

answer:_____

3. [6 pts] Calculate the volume, in liters, of 2.26 M potassium hydroxide that contains 8.42 g of solute. Circle the correct answer below.

0.0510 L	0.0664 L	0.0730 L	0.0931 L	0.165 L
0.3729 L	2.26 L	15.1 L	51.0 L	56.1 L
73.0 L	93.1 L	156 L	373 L	15,100 L

4. [3 pts each]

Give the formula of the precipitate formed in the reaction of sodium sulfide and nickel (II) sulfate. _____

Give the formula of sulfurous acid. _____

Give the formula of ammonia. _____

Give the formula of one strong acid. _____

name_____

5. [3 pts] In the space provided, draw a simple sketch showing the interaction between an aqueous sodium ion and a water molecule.

6. Complete each reaction and write the **balanced net ionic equations in the boxes provided.

a. [10 pts] hydrochloric acid (aq) + lead(II) nitrate (aq) → ???

reminder: net ionic?

b. [10 pts] barium hydroxide (aq) + sulfuric acid (aq) → ???

reminder: net ionic?

7. I_2 + Cl_2 → ICl_3 (**unbalanced**)

[4 pts] How many grams of final product can be prepared from the reaction of 5.0 grams of chlorine and 5.0 grams of iodine? (You must first balance the above equation.) **Show your work** and write your answer in the space. (*Include unit and round your answer appropriately. Answers that are not supported by a complete setup will not earn credit.*)

Answer:_____g ICl_3

8. [2 pts each] Give the correct **oxidation number** for each requested atom.

O in H_2O_2 _____ Cr in chromate ion _____ Fe in $FePO_4$_____

name_____

THE PERIODIC TABLE

	1 (1A)												13 (3A)	14 (4A)	15 (5A)	16 (6A)	17 (7A)	18 (8A)
1	1 H 1.008	2 (2A)																2 He 4.003
2	3 Li 6.941	4 Be 9.012											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
3	11 Na 22.99	12 Mg 24.31	3 (3B)	4 (4B)	5 (5B)	6 (6B)	7 (7B)	8	9 (8B)	10	11 (1B)	12 (2B)	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.45	18 Ar 39.95
4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.87	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.96	43 Tc (98)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209.0	84 Po (209)	85 At (210)	86 Rn (222)
7	87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (265)	105 Db (268)	106 Sg (271)	107 Bh (272)	108 Hs (277)	109 Mt (276)	110 Ds (281)	111 Rg (280)	112 Cn (285)	113 Uut (284)	114 Uuq (289)	115 Uup (288)	116 Uuh (293)	117 Uus (294)	118 Uuo (294)

58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (145)	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0
90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)

Based on IUPAC 2007 (publ 2009).

Potentially useful information:

6.022×10^{23}

Solubility trends:

1. Group 1 (1A) compounds, ammonium compounds, and acids are soluble.
2. All nitrates, acetates, chlorates, and perchlorates are soluble.
3. Silver, lead, mercury(I) and copper(I) compounds are INSOLUBLE.
4. Chlorides, bromides, and iodides are soluble.
5. Sulfates are soluble except calcium sulfate and barium sulfate.
6. Compounds with anions of 2– or 3– charge are INSOLUBLE.
7. Hydroxides are INSOLUBLE except calcium hydroxide and barium hydroxide.