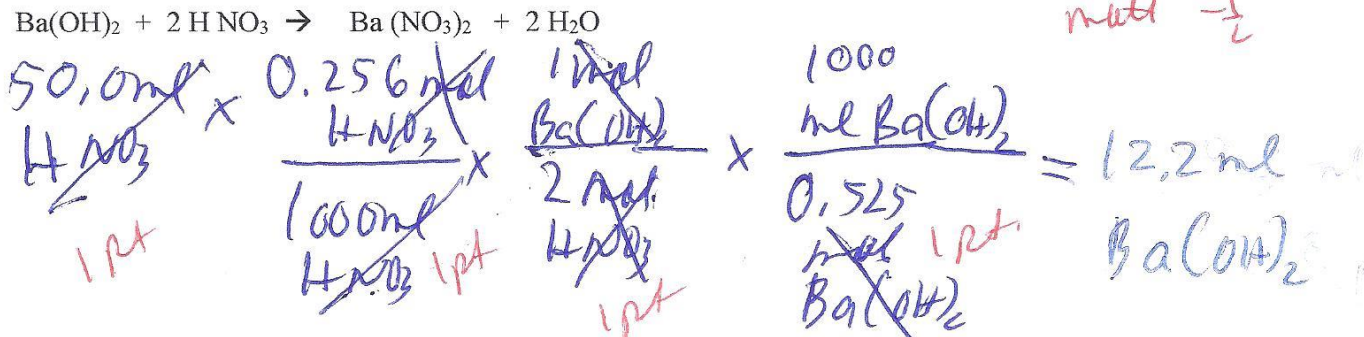


BA = bad attempt **NA = not attempt**

Name Key Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (20 total pts)

1. What volume of 0.525 M Ba(OH)₂ neutralizes 50.0 mL of a 0.256 M HNO₃ solution? (5 pts)



2. Assign the oxidation states of the following highlighted in bold. Briefly explain why you chose your number. If you need to do some algebra to get the oxidation state, please briefly show your algebra. (4 pts)

a. H₂ 0 element

2 pt
NA work - 1

b. K MnO₄ +1 -2 +7

$+1 + Mn + 4(-2) = \text{Zero}$
 $Mn = 0 + 8 - 1 = +7$
 $60n - 1 = 4$

3. If n = 5, what are the possible values of l? (4 pts)

l = 0, 1, 2, 3, 4

same m_l BA - 2

5 a. Give the electron configuration of **As** in the format 1s², 2s², etc. (must show starting with 1s) (2 pts)

1s², 2s², 2p⁶, 3s², 3p⁶, 4s², 3d¹⁰, 4p³

b. give the **valence** electron configuration of the element **As** (1 pt) (not abbreviation)

4s², 4p³ *not valence - 1/2*

b. Give the **valence orbital filling diagram** for the element **As** using lines to represent orbitals (& arrows for electrons) (2 pt)



not valence - 1/2

4. Circle the one **Larger** element for each letter. (no explanation needed) (2 pts)

(a) C vs F

(b) C vs. Sn

larger down group
smaller across period

Please show work on all questions for partial credit even on questions which do not specify. (20 total pts)

1. What volume of 1.26 M Ba(OH)₂ neutralizes 152.2 mL of a 0.367 M HNO₃ solution? (5 pts)



152.2 mL \times $\frac{0.367 \text{ mol HNO}_3}{1000 \text{ mL HNO}_3}$ \times $\frac{1 \text{ mol Ba(OH)}_2}{2 \text{ mol HNO}_3}$ \times $\frac{1000 \text{ mL}}{1.26 \text{ mol Ba(OH)}_2}$ = 22.1 mL Ba(OH)₂

Handwritten notes: "math -1", "used m1v1 = m2v2", "Ba(OH)2 1pt", "1000ml", "2 mol HNO3 1pt", "1.26 mol Ba(OH)2"

2. Assign the oxidation states of the following highlighted in bold. Briefly explain why you chose your number. If you need to do some algebra to get the oxidation state, please briefly show your algebra. (4 pts)

a. H₂O +1 *2pt*
 O is -2, H is +1

b. SO₄²⁻ +6 *2pt*
 O is -2
 S + 4(-2) = -2
 S = -2 + 8 = +6

NW + wrong -2

3. If *l* = 2, what are the possible values of *m_l*? (4 pts) (*l* = d subshell)

m_l = -2, -1, 0, +1, +2 *gave 0 to 0 1 -2 BA*

5 a. Give the electron configuration of Sr in the format 1s², 2s², etc. (must start with 1s) (2 pts)

1s², 2s², 2p⁶, 3s², 3p⁶, 4s², 3d¹⁰, 4p⁶, 5s² *1pt*

b. give the valence electron configuration of Sr (1 pt) (not abbreviation)

5s² *not valence -1/2*

c. Give the valence orbital filling diagram for Sr using lines to represent orbitals. (& arrows for electrons) (2 pt)

1s
5s *not valence -1/2*

4. Circle the one larger atom in each letter. (no explanation needed) (2 pts)

(a) Ca vs. Ba

(b) F vs. B

*larger down group
 smaller across period*

BA = bad attempt NA = not attempt

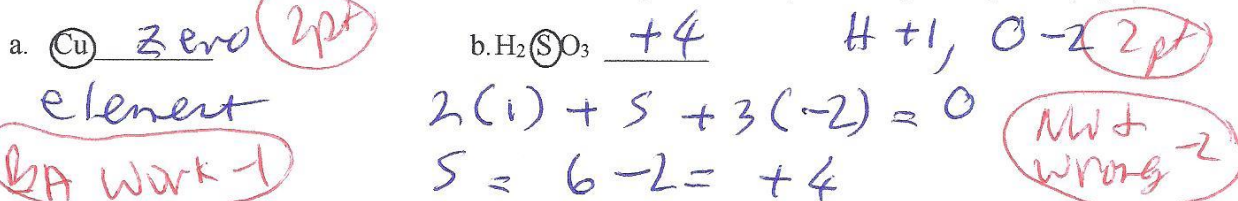
Name Key Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (20 total pts)

1. You are doing a titration in which you use 0.525 M KOH to neutralize 250.2 mL of a 1.52 M solution of HF. How many mL of the KOH will you need to do your titration? $M_a V_a = M_b V_b$ (4 pts)

$M_b = 0.525 M$ $V_b = ?$ $M_a = 1.52 M$ $V_a = 250.2 ml$
 $V_b = \frac{M_a V_a}{M_b} = \frac{(1.52 M)(250.2 ml)}{(0.525 M)} = 724 ml$ (math -1/2)

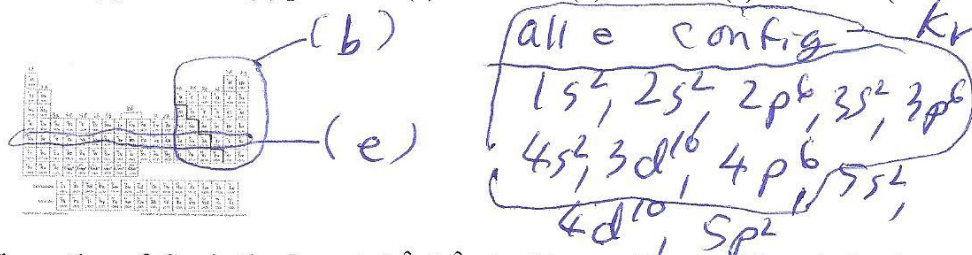
2. Assign the oxidation states of the following circled. Briefly explain why you chose your number. If you need to do some algebra to get the oxidation state, please briefly SHOW your algebra. (4 pts)



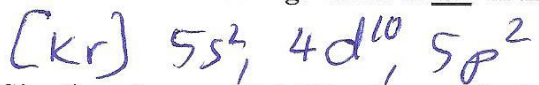
3. If $n = 4$ what are the possible values of l ? For the l values that you gave, assign the spdf designation for the l . (4 pts)

$l = 0$ is (s) or (p) or (d) or (f) (circle one) $l = 2$ is (s) or (p) or (d) or (f) (circle one)
 $l = 1$ is (s) or (p) or (d) or (f) (circle one) $l = 3$ is (s) or (p) or (d) or (f) (circle one)

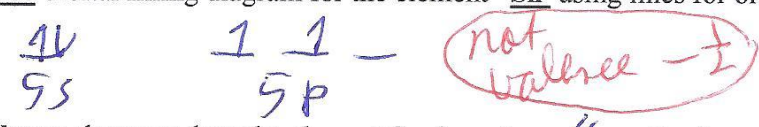
4. Fill the letters into the blank. (a) s block (b) p block (c) d block (d) f block (e) shell # 5 (2 pt)



5 a. Give the electron configuration of Sn in the format $1s^2, 2s^2$, etc. (show noble gas abbreviation) (2 pts)



b. Give the valence orbital filling diagram for the element Sn using lines for orbitals & arrows for electrons (1 pt)



c. How many valence electrons does the element Sn have? 4 (1 pt)

5. Circle the one smaller atom in each letter. (no explanation needed) (2 pts)

(a) Si vs Pb (b) Pb vs Rn

larger down group smaller across period

BA = bad attempt NA = not attempt

Name Key Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (20 total pts)

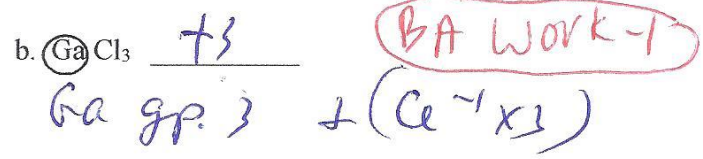
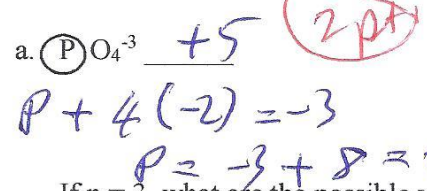
1. You are doing a titration in which you use 3.21 M KOH to neutralize 120.2 mL of a 0.523 M solution of HF. How many mL of the KOH will you need to do your titration? $M_a V_a = M_b V_b$ (4 pts)

math - 1/2 *BA - 2* *pink*

$$M_b = 3.21 M \quad V_b = ? \quad M_a = 0.523 \quad V_a = 120.2 \text{ mL}$$

$$V_b = (M_a V_a / M_b) = [(0.523)(120.2)] / 3.21 = 19.6 \text{ mL}$$

2. Assign the oxidation states of the following circled. Briefly explain why you chose your number. If you need to do some algebra to get the oxidation state, please briefly SHOW your algebra. (4 pts)

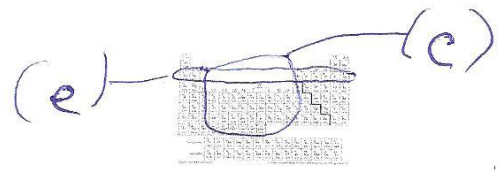


3. If $n = 3$, what are the possible values of l ? For the l values that you gave, assign the spdf designation for your l . (4 pts)

$l = 0$ is [(s) or (p) or (d) or (f)] (circle one) $l = 2$ is [(s) or (p) or (d) or (f)] (circle one)

$l = 1$ is [(s) or (p) or (d) or (f)] (circle one)

4. Fill the letters into the blank. (a) s block (b) p block (c) d block (d) f block (e) shell # 2 (2 pts)



5 a. Give the electron configuration of Br in the format $1s^2, 2s^2$, etc. (show noble gas abbreviation) (2 pts)

$1s^2, 2s^2, 2p^6, 3s^2, 3p^6, 4s^2, 3d^{10}, 4p^5 = [\text{Ar}] 4s^2, 3d^{10}, 4p^5$

b. Give the orbital filling diagram for the valence electrons for the element Br use lines for orbitals & arrows for electrons (1 pt)



c. How many valence electrons does the element Br have? 7 (1 pt)

5. Circle the one smaller atom in each letter. (no explanation needed) (2 pts)

(a) Be vs. Sr

(b) Ge vs. Kr

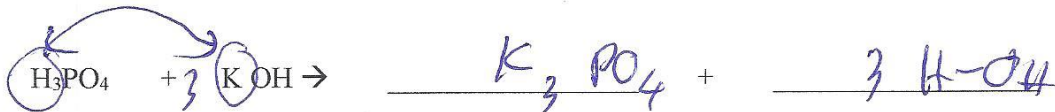
larger down group
smaller across period

BA = bad attempt WA = wrong attempt

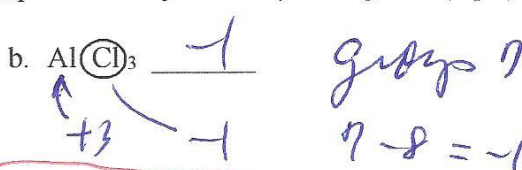
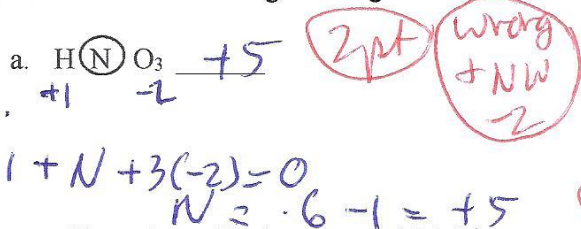
Name Key Print Name _____

Please show work on all questions for partial credit even on questions which do not specify. (20 total pts)

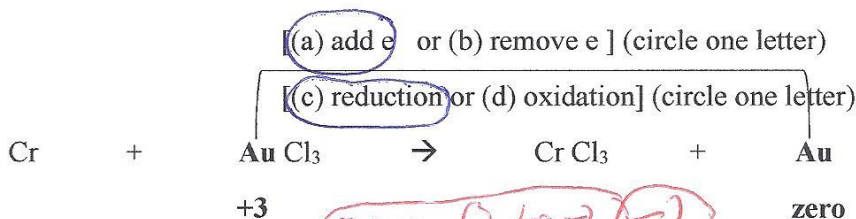
1. Complete the following acid base reaction. (you do not need to balance the reaction) (4 pts)



2. Assign the oxidation states of the following circled. Briefly explain why you chose your number. If you need to do some algebra to get the oxidation state, please briefly SHOW your algebra. (4 pts)

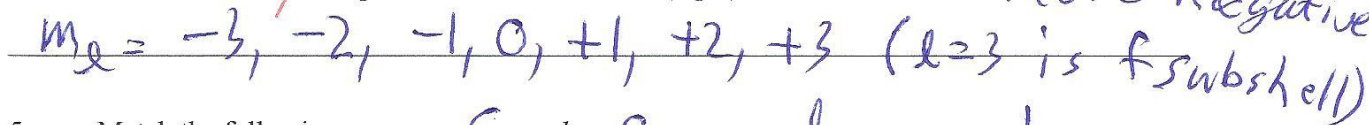


3. Given the oxidation states which I have provided, circle 2 letters associated with the bracket (the bracket should get either) [(a) or (b)] & [(c) or (d)] (e = my abbreviation for electron) (2pts)



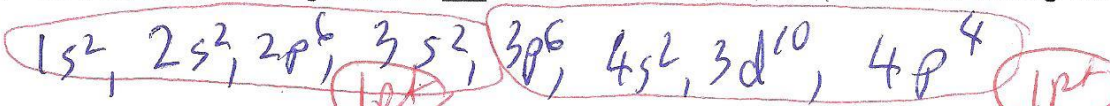
\bar{e} are negatively charged - add \bar{e} becomes more negative
save 0 to -2 -2
l=3 is f subshell

4. If $l = 3$, what are the possible values of m_l ? (4 pts)

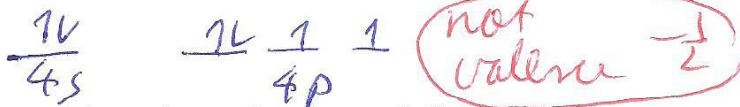


5. Match the following: n c l a m_l d m_s b
 (a) Subshell (b) spin quantum number (c) shell (d) orbital (4 letters, 4 blanks)

5 a. Give the electron configuration of Se in the format $1s^2, 2s^2$, etc. (must show starting with $1s$) (2 pts)



b. Give the valence orbital filling diagram for the element Se using lines to represent orbitals (& arrows for electrons) (2 pt)



6. Circle the one larger element for each letter. (no explanation needed) (2 pts)



larger down group
smaller across period