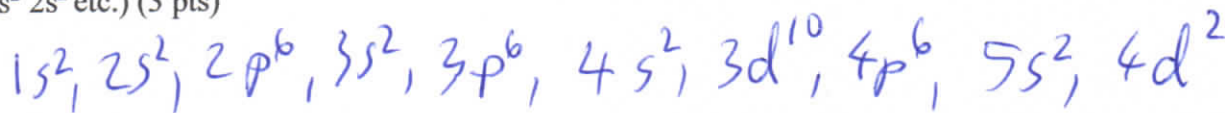


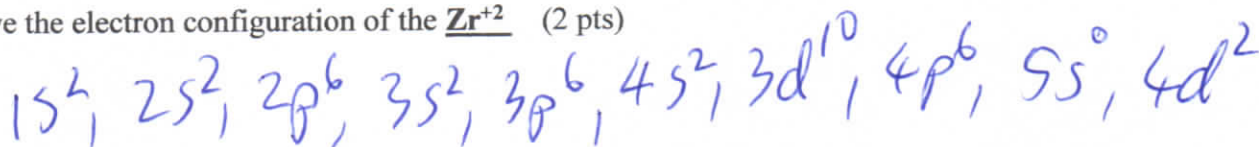
Name key Print Name \_\_\_\_\_

Please show work on all questions for partial credit even on questions which do not specify. (25 total pts)

1. (a) Show the electron configuration for the element **Zr** (one of the transition metals) in the format ( $1s^2 2s^2$  etc.) (3 pts)



(b) Give the electron configuration of the **Zr<sup>+2</sup>** (2 pts)



2. Give the **valence** electron configuration diagram for the element **Se** showing a line for an orbital and up and down arrows for the +1/2 and -1/2 electrons (3 pts)

(**format** required:  $\uparrow\downarrow$   $\uparrow$  \_\_\_\_\_) (format is not necessarily the answer)



valence only  
is only outermost  
period # (n-principal  
quantum #)

3. In each letter circle one of 2 choices (5 pts, 1 pt each)

(a) larger size [(P) or (Cl)]

larger  $\leftarrow$

(b) higher ionization energy: [(C) or (Ge)]

$\rightarrow$   $\uparrow$  higher IE

(c) higher electronegativity [(Ge) or (Br)]

$\leftarrow$   $\downarrow$

(d) larger size [(Li) or (Li<sup>+</sup>)]

cation - smaller

(e) larger size [(Br) or (Br<sup>-</sup>)]

anion larger

4. Give Lewis Dot Symbol for the element **Si** (2 pts)

# valence e = 4

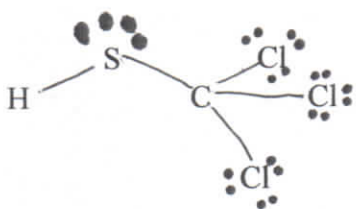


5. For the following give the Lewis Dot structure by:

(a) Show work for valence electron count. (6 pts) (S C Cl<sub>3</sub>H)

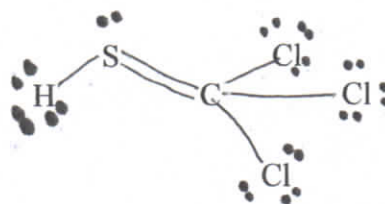
$$\begin{array}{ccccccc}
 S & + & C & + & Cl & + & H \\
 6e & + & 4e & + & (7e)3 & + & 1e = 32e
 \end{array}$$

(b) Given the following choices circle the letter under the correct Lewis Dot structure. (2 pts)



(A)

$$16 \times 2 = 32e$$



(B)

$$19 \times 2 = 38e$$

(c) Give one thing wrong with the Lewis Dot structure which you did not circle. (2 pts)

① H has more than duet ② too many e

③ C has expanded octet not quantum mechanically allowed

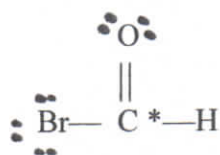
③ S has  
 $6 - \frac{6}{2} - 2 = 1$   
 $4 - \frac{10}{2} = 1$   
 S is EN  
 C is electro-  
 at the atom with  
 positive

Extra Credit: (3 pts)

Given the following Lewis Dot structure, complete the following VSEPR questions.

VSEPR Problem: Answer the following for the following correct Lewis Dot structure the \* (3 pts total, 1/2 pt each)

at the atom with



What is the VSEPR # electron pairs ("electron domains") 3 (C=O is one) e domain

How many lone pair does the atom with the \* have? zero

What is the VSEPR geometry of electron pairs? trigonal planar

What is the VSEPR geometry of the molecule? trigonal planar

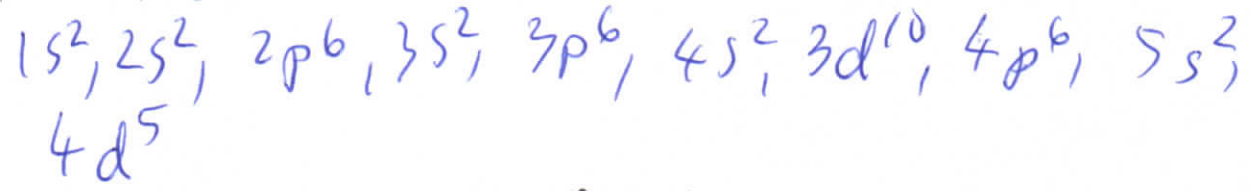
What is the bond angle between Br-C=O? 120°

What is the hybridization of the atom with the \*? sp<sup>2</sup>

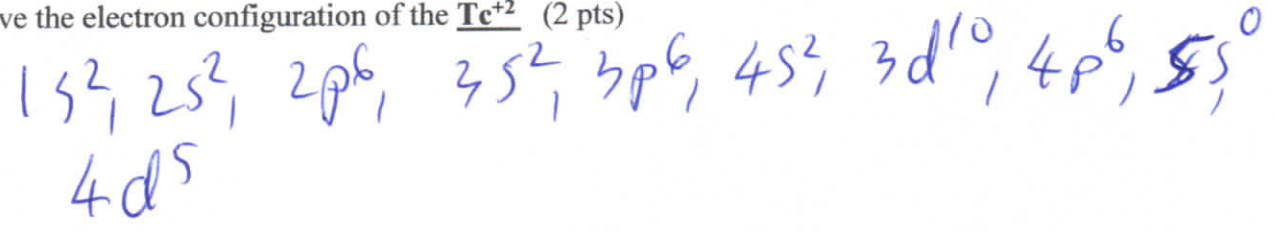
Name Key Print Name \_\_\_\_\_

Please show work on all questions for partial credit even on questions which do not specify. (25 total pts)

1. (a) Show the electron configuration for the element **Tc** (one of the transition metals) in the format (1s<sup>2</sup> 2s<sup>2</sup> etc.) (3 pts)

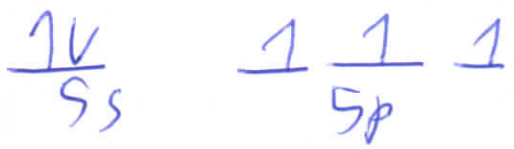


(b) Give the electron configuration of the **Tc<sup>+2</sup>** (2 pts)



2. Give the **valence** electron configuration diagram for the element **Sb** showing a line for an orbital and up and down arrows for the +1/2 and -1/2 electrons (3 pts)

(**format** required:  $\uparrow\downarrow$   $\uparrow$   $\underline{\quad}$   $\underline{\quad}$   $\underline{\quad}$ ) (format is not necessarily the answer) valence e<sup>-</sup> 5s<sup>2</sup>, 5p<sup>3</sup>



3. In each letter circle one of 2 choices (5 pts, 1 pt each)

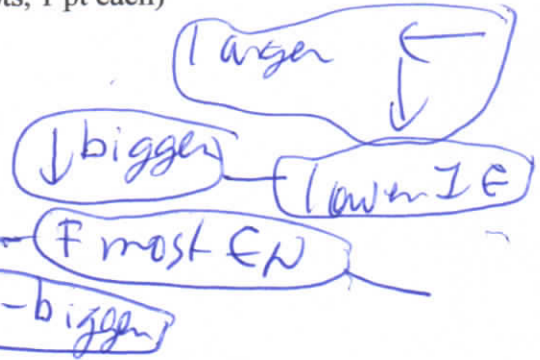
(a) smaller size [(P) or (Cl)]

(b) lower ionization energy: [(C) or (Ge)]

(c) lower electronegativity [(O) or (Te)]

(d) smaller size [(F) or (F<sup>-</sup>)]

(e) smaller size [(Mg) or (Mg<sup>+2</sup>)]



cation - smaller

4. Give Lewis Dot Symbol for the element **Se** (2 pts)



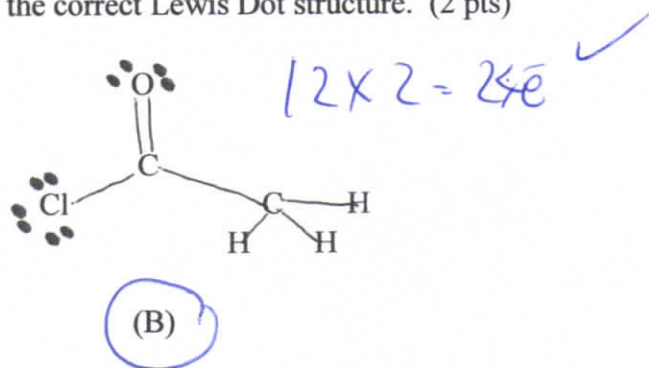
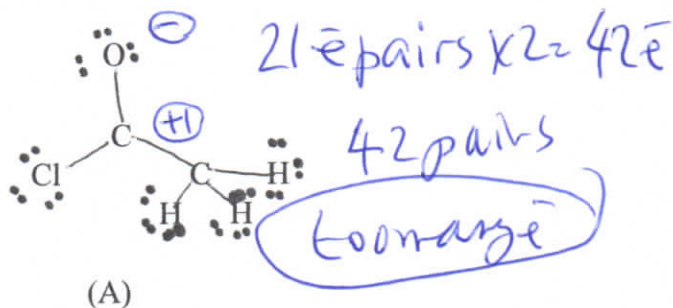


5. For the following give the Lewis Dot structure by:

(a) Show work for valence electron count. (C<sub>2</sub>ClO<sub>3</sub>H<sub>3</sub>) (6 pts)

$$\begin{matrix} \text{C} & \text{Cl} & \text{O} & \text{H} \\ (4e^-) \times 2 & + & (7e^-) & + & (6e^-) & + & 3(1e^-) & = & 24e^- \end{matrix}$$

(b) Given the following choices circle the letter under the correct Lewis Dot structure. (2 pts)



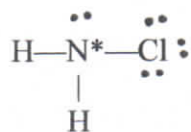
(c) Give one thing wrong with the Lewis Dot structure which you did not circle. (2 pts)

- ① H has more than duet ② too many e<sup>-</sup> in trical structure  
 ③ C has less than octet ④ C has + O has -

**Extra Credit: (3 pts)**

Given the following Lewis Dot structure, complete the following VSEPR questions.

VSEPR Problem: Answer the following for the following correct Lewis Dot structure at the atom with the \* (3 pts total, 1/2 pt each)



What is the VSEPR # electron pairs ("electron domains") 4

How many lone pair does the atom with the \* have? 1

What is the VSEPR geometry of electron pairs? tetrahedral

What is the VSEPR geometry of the molecule? trigonal pyramidal

What is the bond angle between H-N-H? 109.5°

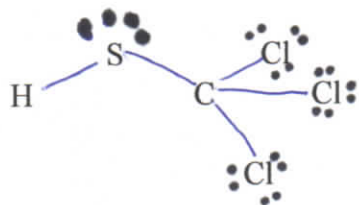
What is the hybridization of the atom with the \*? sp<sup>3</sup>



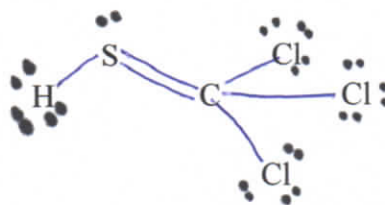
5. For the following give the Lewis Dot structure by:

(a) Show work for valence electron count. (6 pts)  $(5C\ Cl_3H)$

(b) Given the following choices circle the letter under the correct Lewis Dot structure. (2 pts)



(A)



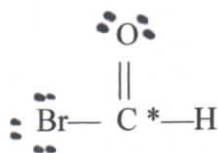
(B)

(c) Give **one thing** wrong with the Lewis Dot structure which you did not circle. (2 pts)

**Extra Credit: (3 pts)**

Given the following Lewis Dot structure, complete the following VSEPR questions.

VSEPR Problem: Answer the following for the following correct Lewis Dot structure **at the atom with the \*** (3 pts total, 1/2 pt each)



What is the VSEPR # electron pairs (“electron domains”) \_\_\_\_\_

How many lone pair does the atom with the \* have? \_\_\_\_\_

What is the VSEPR geometry of electron pairs? \_\_\_\_\_

What is the VSEPR geometry of the molecule? \_\_\_\_\_

What is the bond angle between Br—C=O? \_\_\_\_\_

What is the hybridization of the atom with the \*? \_\_\_\_\_

Name \_\_\_\_\_ Print Name \_\_\_\_\_

Please show work on all questions for partial credit even on questions which do not specify. (25 total pts)

1. (a) Show the electron configuration for the element **Tc** (one of the transition metals) in the format ( $1s^2 2s^2$  etc.) (3 pts)

(b) Give the electron configuration of the **Tc<sup>+2</sup>** (2 pts)

2. Give the **valence** electron configuration diagram for the element **Sb** showing a line for an orbital and up and down arrows for the +1/2 and -1/2 electrons (3 pts)

**(format required:**  $\frac{\uparrow\downarrow}{1s}$   $\frac{\uparrow}{2s}$   $\frac{\quad}{2p}$   $\frac{\quad}{\quad}$   $\frac{\quad}{\quad}$   $\frac{\quad}{\quad}$ ) (format is not necessarily the answer)

3. In each letter circle one of 2 choices (5 pts, 1 pt each)

(a) smaller size [(P) or (Cl)]

(b) lower ionization energy: [(C) or (Ge)]

(c) lower electronegativity [(O) or (Te)]

(d) smaller size [(F) or (F<sup>-</sup>)]

(e) smaller size [(Mg) or (Mg<sup>+2</sup>)]

4. Give Lewis Dot Symbol for the element **Se** (2 pts)