

CH 121

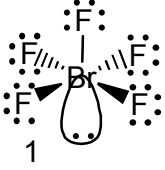
General Chemistry Exam 3 June 19, 2003

Name: _____
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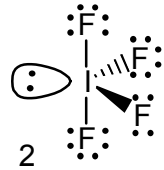
SSN: * * * - * * - _____
(last 4 digits)

Each question is worth 1 point.
Circle your answer clearly, otherwise no credit will be given.

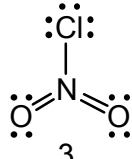
- How many electrons can be described by the set of quantum numbers $n = 3$, $l = 1$, $m_l = -1$, $m_s = -1/2$?
 - 1
- Which of the following elements is a d-block element?
 - copper
- Which rare gas symbol would be used for the rare gas notation for the electronic configuration of the element silver?
 - krypton
- What is the electronic configuration of Se^{2-} ?
 - $[\text{Ar}] 4s^2 4p^6 3d^{10}$
- Which of the following atoms has the largest number of valence electrons?
 - P
- Which of the following particles has the largest radius?
 - N^{3-}
- Which species has more than eight electrons around the central atom?
 - BrF_3
- Which of the following elements is most likely to form compounds involving an expanded valence shell of electrons?
 - P
- Which of the following is (are) **CORRECT** Lewis dot structures?



1

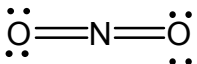


2



3

 - 1 only
- The Lewis structure below represents



b. NO_2^+

11. Which one of the following has a Lewis structure most like that of SO_3 ?

e. CO_3^{2-}

12. Which one of the following species would have a Lewis structure most like that of SO_2 ?

d. NO_2^-

13. What are the oxidation numbers of sulfur and oxygen in the molecule SO_3 ?

b. Sulfur is +6 and oxygen is -2.

14. Which response contains all the characteristics listed that should apply to BF_3 ?

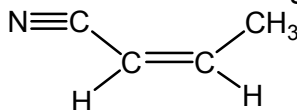
1. trigonal planar
2. one unshared pair of electrons on B
3. sp^2 hybridized boron atom
4. polar molecule
5. polar bonds

d. 1, 3, and 5

15. What is the hybridization of the sulfur atom in SF_4 ?

c. sp^3d

16. How many sigma (σ) bonds are in the following molecule?



d. 9

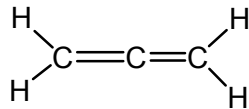
17. In the combustion of methane, CH_4 , what change in hybridization (if any) occurs to the carbon atom?

d. sp^3 to sp

18. What kind of hybrid orbital set is used in the sulfur atom in the compound SCl_6 ?

e. sp^3d^2

19. What hybrid orbital set is used by the terminal carbon atom in the following molecule?



b. sp^2

20. Using the VSEPR theory, predict the molecular shape of ClF_3 .

b. T-shaped

21. The species below having the longest bond (if any) is

d. N_2^{2-}

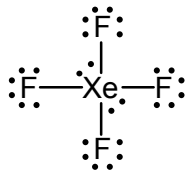
22. The bond order of the O_2^{2-} ion is

a. 1

23. Which of the following groups of elements is arranged in order of increasing electronegativity?

c. $\text{P} < \text{S} < \text{O} < \text{F}$

24. Draw the Lewis structure of XeF_4 in the space below.



25. Draw the Lewis structure of SO_4^{2-} in the space below.

