

CHM151 q 8, spring 2005

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- c 1. Which of the following elements is most likely to form a molecule that exceeds the octet rule?
- a. Ne
 - b. C
 - c. P
 - d. Be
 - e. O

- a 2. What is the total number of valence electrons in a dinitrogen tetroxide molecule?
- a. 34
 - b. 18
 - c. 32
 - d. 24
 - e. 26

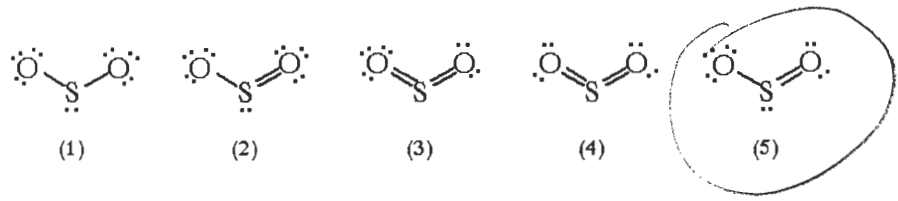
$$\begin{array}{r}
 N_2O_4 \\
 \begin{array}{l}
 \text{L} \quad \text{L} \\
 4 \times 6 = 24 \\
 2 \times 5 = 10 \\
 \hline
 34
 \end{array}
 \end{array}$$

- b 3. Which of the following compounds would be expected to have the strongest ionic bonds?
- a. BaS
 - b. MgO
 - c. RbI
 - d. NaBr
 - e. SrO

- e 4. Which of the following molecules or ions are isoelectronic: O₂, N₂, CN⁻, CO, and F₂?
- a. O₂, N₂, and F₂
 - b. O₂ and CO
 - c. O₂, CN⁻, and F₂
 - d. N₂ and F₂
 - e. N₂, CN⁻, and CO

v.e's 12 10 10 10 14

- e 5. Which of the following is a correct Lewis structure for SO₂?



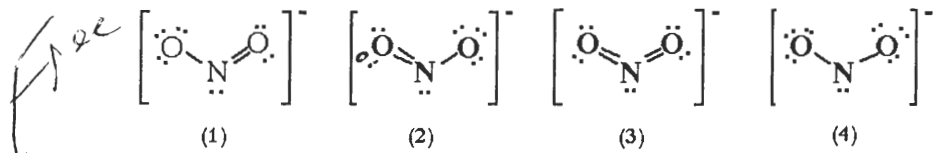
- a. 3
- b. 4
- c. 1
- d. 2
- e. 5

$$\begin{array}{r}
 SO_2 \\
 \text{L} \quad \text{L} \\
 2 \times 6 \\
 1 \times 6 \\
 \hline
 18 \text{ v.e.}
 \end{array}$$

Name: Key

ID: B

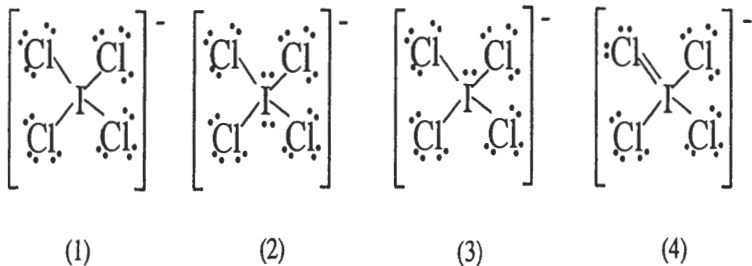
6. Which of the following are resonance structures for nitrite ion, NO_2^- ?



- a. 2 and 4
 b. 1, 2 and 3
 c. 1 and 2
 d. 2 and 3
 e. 1, 2 and 4

*Missing 2 e⁻
 so free*

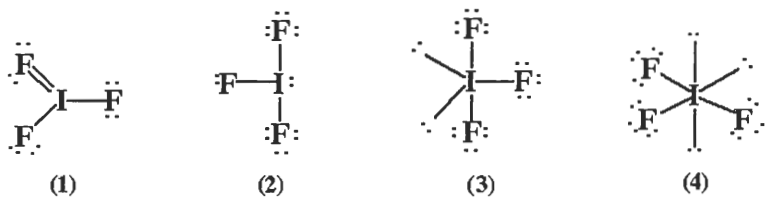
c 7. What is the correct Lewis structure for ICl_4^- ?



- a. 2 and 4
 b. 1
 c. 2
 d. 3
 e. 4

36 v.e

e 8. What is the correct Lewis structure for IF_3 ?



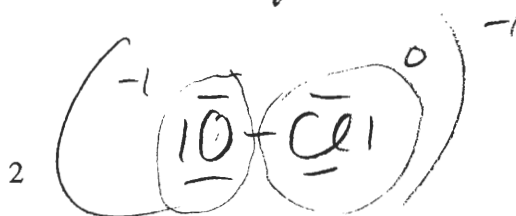
- a. 1
 b. 4
 c. 2 and 4
 d. 2
 e. 3

28 v.e's

a 9. What is the formal charge on each atom in the hypochlorite ion, OCl^- ?

- a. O = -1, Cl = 0
 b. O = -1, Cl = +1
 c. O = -2, Cl = +1
 d. O = +1, Cl = -2
 e. O = 0, Cl = -1

14 v.e



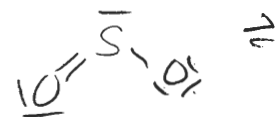
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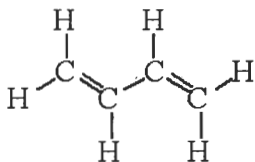
Key

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- D 10. Use VSEPR theory to predict the electron pair geometry and the molecular geometry of SO_2 . 18 v.e.
- e⁻ pair geometry = trigonal planar, molecular geometry = linear
 - e⁻ pair geometry = tetrahedral, molecular geometry = linear
 - e⁻ pair geometry = tetrahedral, molecular geometry = trigonal planar
 - e⁻ pair geometry = trigonal planar, molecular geometry = bent
 - e⁻ pair geometry = tetrahedral, molecular geometry = bent



- e 11. How many sigma (σ) bonds and pi (π) bonds are in the following molecule?



- eleven σ and zero π
- six σ and two π
- seven σ and two π
- two σ and nine π
- nine σ and two π

B

12. In which of the following molecules or ions does the central atom have sp^2 hybridization: NH_2^- , H_2O , BH_3 , SO_2 ?

- NH_2^- and BH_3
- BH_3 and SO_2
- H_2O and SO_2
- NH_2^- , H_2O , and SO_2
- H_2O , BH_3 , and SO_2

