

Ser.#:

Q1. Which statement(s) is(are) **false** concerning CO₂?

1. The molecular geometry is linear.
2. The electron pair arrangement is linear.
3. The C-O bond is polar.
4. The molecule is polar

A. 4

B. 2, 4

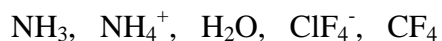
C. 1, 3

D. 1, 2

Q2. What is the electron pair arrangement about the central atom of XeF₄?

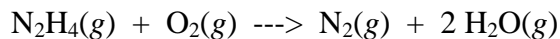
- A. trigonal planar
- B. tetrahedral
- C. octahedral
- D. trigonal bipyramidal

Q3. Which of the following have the tetrahedral molecular geometry?

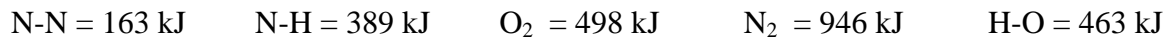


- A. NH₃, NH₄⁺, H₂O, CF₄
- B. NH₄⁺, CF₄
- C. NH₄⁺, ClF₄⁻, CF₄
- D. all of them

Q4. Calculate the enthalpy change for the reaction



based on the following bond energies:



- A. -433 kJ
- B. +345 kJ
- C. -581 kJ
- D. -1359 kJ

Q5. Arrange the following elements in order of **increasing** electronegativity

N, O, P, Rb

- A. $\text{N} < \text{O} < \text{P} < \text{Rb}$
- B. $\text{Rb} < \text{P} < \text{N} < \text{O}$
- C. $\text{O} < \text{N} < \text{P} < \text{Rb}$
- D. $\text{Rb} < \text{N} < \text{O} < \text{P}$

Q6. Which one of the following reactions is associated with the definition of the the lattice energy of MgI_2 ?

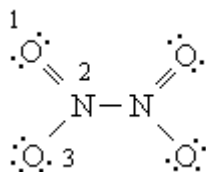
- A. $\text{MgI}_2(aq) \rightarrow \text{Mg}^{2+}(aq) + 2 \text{I}^{-}(aq)$
- B. $\text{MgI}_2(aq) \rightarrow \text{Mg}^{2+}(g) + 2 \text{I}^{-}(g)$
- C. $\text{MgI}_2(s) \rightarrow \text{Mg}^{2+}(g) + 2 \text{I}^{-}(g)$
- D. $\text{MgI}_2(g) \rightarrow \text{Mg}^{2+}(g) + 2 \text{I}^{-}(g)$

Q7. Arrange the following in order of **increasing** lattice energy.



- A. NaCl < LiF < MgF₂
- B. MgF₂ < LiF < NaCl
- C. LiF < NaCl < MgF₂
- D. NaCl < MgF₂ < LiF

Q8. Consider the following Lewis structure



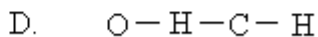
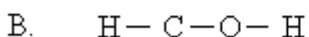
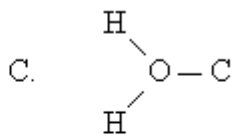
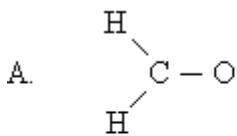
The formal charges on the atoms labeled 1, 2 and 3 are

- A. 0, 0, 0
- B. 0, +1, -1
- C. +1, 0, -1
- D. -1, +1, 0

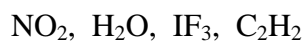
Q9. Select an appropriate Lewis structure for BrNO, and note the **more** polar bond in the molecule.

- | | |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| A. $\text{:}\ddot{\text{Br}}-\ddot{\text{N}}=\ddot{\text{O}}\text{:}$, Br - N | C. $\text{:}\ddot{\text{Br}}-\ddot{\text{N}}-\ddot{\text{O}}\text{:}$, N - O |
| B. $\text{:}\ddot{\text{Br}}-\ddot{\text{N}}-\ddot{\text{O}}\text{:}$, Br - N | D. $\text{:}\ddot{\text{Br}}-\ddot{\text{N}}=\ddot{\text{O}}\text{:}$, N - O |

Q10. The **most likely** arrangement (connectivity) for the molecule H_2CO is:



Q11. Which of the following molecules **do not** satisfy the octet rule?



A. NO_2 and H_2O

B. H_2O and C_2H_2

C. IF_3 and C_2H_2

D. NO_2 and IF_3

Q12. Determine the number of covalent bonds (CB), and the number of lone pairs (LP) in N_2O_4 , assuming all atoms achieve a noble gas configuration.

A. CB = 14, LP = 40

B. CB = 7, LP = 20

C. CB = 14, LP = 20

D. CB = 7, LP = 10

Q13. What is the molecular geometry of PF_3 ?

- A. trigonal planar
- B. trigonal pyramidal
- C. tetrahedral
- D. T-shaped

Q14. According to the VSEPR theory, the expected geometry of the complex ion, ICl_4^- , would be:

- A. tetrahedral
- B. square planar
- C. square pyramidal
- D. octahedral