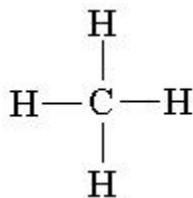


## Chemistry, Module 3 Lesson 4 Test

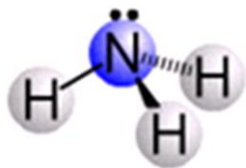


- 1) Which of the following is the correct molecular shape of CH<sub>4</sub>?
- linear **Incorrect** the structure of CH<sub>4</sub> has 4 bonding pairs of electrons and no lone pairs
  - tetrahedral **Correct** the structure of CH<sub>4</sub> has 4 bonding pairs of electrons and no lone pairs
  - bent **Incorrect** the structure of CH<sub>4</sub> has 4 bonding pairs of electrons and no lone pairs
  - trigonal planar **Incorrect** the structure of CH<sub>4</sub> has 4 bonding pairs of electrons and no lone pairs



- 2) The predicted shape of a HCN molecule is
- bent **Incorrect** HCN has 0 lone pairs on the central atom and 2 bonding groups of electrons on the central atom because the triple bond counts as a single bonding group
  - tetrahedral **Incorrect** HCN has 0 lone pairs on the central atom and 2 bonding groups of electrons on the central atom because the triple bond counts as a single bonding group
  - linear **Correct** HCN has 0 lone pairs on the central atom and 2 bonding groups of electrons on the central atom because the triple bond counts as a single bonding group
  - trigonal planar **Incorrect** HCN has 0 lone pairs on the central atom and 2 bonding groups of electrons on the central atom because the triple bond counts as a single bonding group

3) What is the molecular geometry of the following molecule?



- a. trigonal planar **Incorrect**; this molecule has 1 lone pair of electrons and 3 bonding groups of electrons.
- b. tetrahedral **Incorrect**; this molecule has 1 lone pair of electrons and 3 bonding groups of electrons.
- c. bent **Incorrect**; this molecule has 1 lone pair of electrons and 3 bonding groups of electrons.
- d. trigonal pyramidal **Correct**; this molecule has 1 lone pair of electrons and 3 bonding groups of electrons.

# of lone pairs of electrons on central atom	# of bonding groups of electrons on central atom	Total number of groups of electrons on central atom	Electron pair Geometry	Molecular Geometry
1	3	4	Tetrahedral	Trigonal pyramidal

- 4) A molecule has 2 lone pairs of electrons and 2 bonding groups of electrons attached to the central atom, what molecular geometry would this molecule have?
- a. tetrahedral **Incorrect**
  - b. trigonal planar **Incorrect**
  - c. trigonal pyramidal **Incorrect**
  - d. bent **Correct**

# of lone pairs of electrons on central atom	# of bonding groups of electrons on central atom	Total number of groups of electrons on central atom	Electron pair Geometry	Molecular Geometry
2	2	4	Tetrahedral	Bent

5) Using the following chart, predict the molecular geometry of  $\text{SO}_3$ .

# of lone pairs of electrons on central atom	# of bonding groups of electrons on central atom	Total number of groups of electrons on central atom	Electron pair Geometry	Molecular Geometry
0	3	3	Trigonal planar	Trigonal planar
1	2	3	Trigonal planar	Bent
0	4	4	Tetrahedral	Tetrahedral
1	3	4	Tetrahedral	Trigonal pyramidal
2	2	4	Tetrahedral	Bent

- tetrahedral **Incorrect**, you need to consider the Lewis Dot structure it has 0 lone pairs on the central atom and 3 bonding groups of electrons on the central atom because a double bond counts as a single bonding group
- trigonal planar **Correct**, it has 0 lone pairs on the central atom and 3 bonding groups of electrons on the central atom because a double bond counts as a single bonding group
- trigonal pyramidal **Incorrect**, you need to consider the Lewis Dot structure it has 0 lone pairs on the central atom and 3 bonding groups of electrons on the central atom because a double bond counts as a single bonding group
- bent **Incorrect**, you need to consider the Lewis Dot structure it has 0 lone pairs on the central atom and 3 bonding groups of electrons on the central atom because a double bond counts as a single bonding group