

This print-out should have 16 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Which of the following molecules is/are polar?

- I) NO_3^-
 II) NO
 III) NO_2

- II only
- III only
- II and III
- I only
- I and II
- I, II and III
- I and III

002 10.0 points

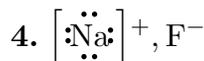
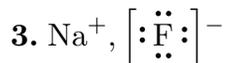
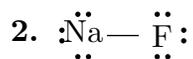
Which of the following is the correct Lewis structure of Nitric Oxide (NO)?

- $:\text{N} \equiv \dot{\text{O}}:$
- $:\ddot{\text{N}} = \dot{\text{O}}:$
- $:\dot{\text{N}} = \ddot{\text{O}}:$
- $:\dot{\text{N}} \equiv \text{O}:$

003 10.0 points

Which of the following is the correct Lewis structure of Sodium Fluoride (NaF)?

- $\text{Na} - \ddot{\text{F}}:$



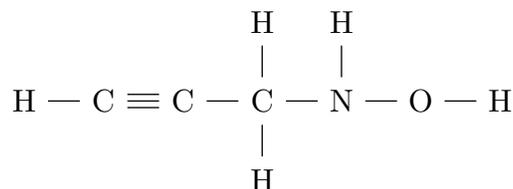
004 10.0 points

Which of the following statements about polarity is false?

- CCl_4 is a polar molecule.
- Lone (unshared) pairs of electrons on the central atom play an important role in influencing polarity.
- Polar molecules must have a net dipole moment.
- Dipole moments can “cancel”, giving a net non-polar molecule.
- Linear molecules can be polar.

005 10.0 points

How many different molecular geometries are necessary to describe the central atoms in the molecule below?



(Note: You will need to add the non-bonding electron pairs.)

- 4
- 2
- 3
- 1

006 10.0 points

Which of the following is a polar molecule composed entirely of non-polar bonds?

1. SiCl_4
2. BI_3
3. O_3
4. C_2H_4
5. CS_2

007 10.0 points

Which of the following substances has a delocalized bond?

1. NH_3
2. CO_3^{2-}
3. CO_2
4. CO
5. ClO_3^-

008 10.0 points

The electronic geometry of the central atom in H_2O is (angular, tetrahedral); its molecular geometry (angular, linear, tetrahedral).

1. angular; angular
2. angular; tetrahedral
3. tetrahedral; linear
4. tetrahedral; angular
5. tetrahedral; tetrahedral

009 10.0 points

Which of the following is a polar molecule?

1. CO_2
2. SiH_4
3. AsCl_3
4. CCl_4

5. Br_2

010 10.0 points

How many π bonds are in the molecule ethyne (HCCH or acetylene)?

1. 0
2. 4
3. 1
4. 3
5. 2

011 10.0 points

The electronic geometry of SnCl_5^- is

1. tetrahedral.
2. linear.
3. octahedral.
4. trigonal bipyramidal.
5. trigonal planar.

012 10.0 points

Which of the compounds

- | | |
|--------------------|---------------------|
| I. AlCl_3 | III. CCl_4 |
| II. SF_6 | IV. XeF_4 |

follow the octet rule?

1. III only
2. IV only
3. I only
4. III and IV only
5. I and III only

013 10.0 points

Consider the species

a) I_2 , b) O_3 , c) I_3^- , d) CS_2 , e) CO .

Which of the species is/are polar?

- | | |
|-------------------|----------|
| | 1. N, O |
| 1. b) and e) only | 2. F, Cl |
| 2. e) only | 3. S, As |
| 3. b) and c) only | 4. N, C |
| 4. c) and e) only | 5. S, Se |

014 10.0 points

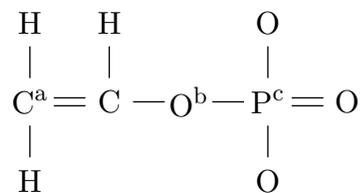
Which of the following molecules is polar?

1. CF_4
2. NH_3
3. H_2
4. CH_4
5. BH_3

015 10.0 points

What are the molecular geometries of the labeled atoms in the Lewis structure below?

Note: only bonding electrons are shown.



1. trigonal planar; linear; trigonal bipyramidal
2. trigonal planar; bent; tetrahedral
3. trigonal pyramidal; linear; see-saw
4. bent; tetrahedral; t-shaped
5. bent; trigonal pyramidal; t-shaped

016 10.0 points

Which pair of elements is listed in order of increasing electronegativity?