

HW07 - VSEPR & VB

⚠ This is a preview of the draft version of the quiz

Started: Aug 8 at 4:51pm

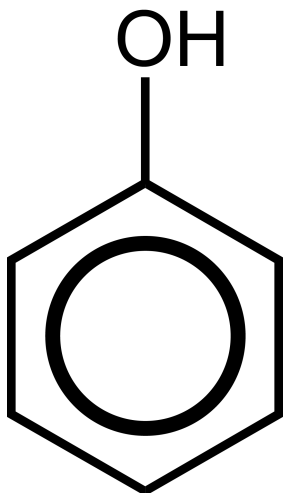
Quiz Instructions

Homework 07 - VSEPR & VB

Question 1

1 pts

Consider the structural formula of phenol.



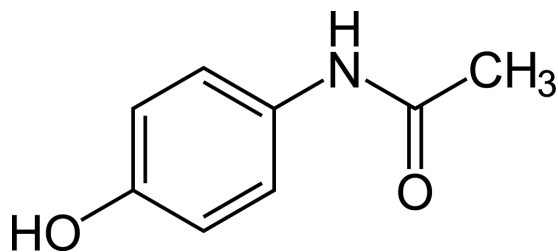
The active ingredient in some oral anesthetics used in sore throat sprays. What is the molar mass of phenol?

- 50 g/mol
- 17 g/mol
- 94 g/mol
- 89 g/mol

Question 2

1 pts

This is the condensed structural formula for acetaminophen, the active ingredient in the over-the-counter medication Tylenol.

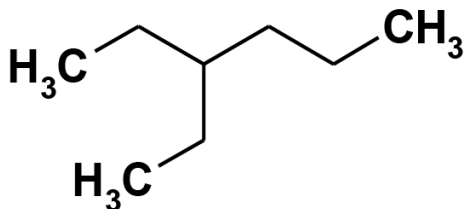


What is the molecular formula of acetaminophen?

- C₈H₈NO
- C₈H₉NO₂
- C₈H₅NO₂
- C₈H₁₁NO₂

Question 3**1 pts**

The following structure is the carbon skeleton for a structural isomer of octane with most of the hydrogen and carbon atoms omitted.

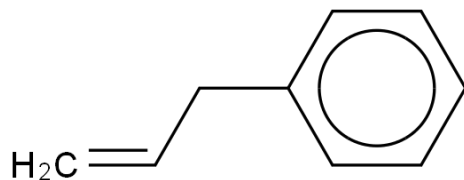


What is the molecular formula of this isomer?

- C₈H₂₄
- C₈H₁₆
- C₈H₁₈
- C₈H₈

Question 4**1 pts**

Consider the following structure:



How many single bonds, double bonds, sigma bonds, and pi bonds (respectively) are represented by this condensed formula?

12, 4, 12, 4

15, 4, 19, 4

11, 7, 18, 7

15, 4, 15, 4

12, 4, 16, 4

Question 5**1 pts**

The electronegativity of H is...

a lot less than that of C.

a lot more than that of C.

about equal to that of C.

Question 6**1 pts**

Which pair of bonded atoms has the largest dipole moment?

C-Cl

C-O C-N C-F**Question 7****1 pts**

Consider a 3-atom molecule A-B-A for which B has a total of only four valence electrons - enough to make two bonds. Predict the A-B-A bond angle.

 180° 90° 109.5° 120°**Question 8****1 pts**

What is the shape (molecular geometry) of COCl_2 ?

 trigonal pyramidal tetrahedral T-shaped trigonal planar**Question 9****1 pts**

Which of the following has bond angles slightly LESS than 120°?

NO_3^- SO_3 I_3^- SF_2 O_3 **Question 10****1 pts**

Draw the Lewis structure for NO_2^- . How many single bonds, double bonds, triple bonds, and unshared pairs of electrons are on the central atom, in that order?

 2, 0, 0, 2 1, 0, 1, 0 4, 0, 0, 0 0, 0, 1, 1 1, 1, 0, 1**Question 11****1 pts**

Determine the molecular geometry of the ion NO_2^- .

 linear trigonal planar bent or angular trigonal pyramidal none of these

Question 12**1 pts**

What is the electronic geometry of IF_4^- ?

- octahedral
- square planar
- tetrahedral
- trigonal bipyramidal
- square pyramidal

Question 13**1 pts**

What is the molecular geometry of IF_4^- ?

- see-saw
- octahedral
- square planar
- square pyramidal
- trigonal planar

Question 14**1 pts**

Is IF_4^- non-polar?

- No, it is polar.
- It cannot be determined from the structure.
- Yes, it is non-polar.

Question 15**1 pts**

What is the geometry around the left-most carbon in the molecule CH_2CHCH_3 ?

- linear
- tetrahedral
- trigonal planar
- trigonal pyramidal

Question 16**1 pts**

Which of the following has bond angles of 90° , 120° , and 180° ?

- XeF_4
- SF_4
- ICl_4^-
- PF_6^-
- IF_5

Question 17

1 pts

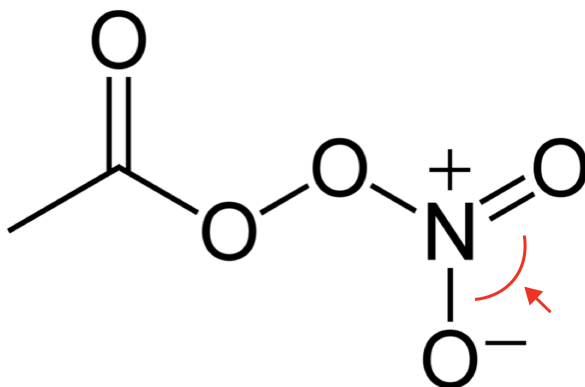
A central atom is surrounded by four chlorine atoms. Which of the following combinations is possible?

- an octahedral electronic geometry and square pyramidal molecular geometry
- a trigonal bipyramidal electronic geometry and t-shaped molecular geometry
- a trigonal bipyramidal electronic geometry and seesaw molecular geometry
- an octahedral electronic geometry and tetrahedral molecular geometry.

Question 18

1 pts

Consider the compound peroxyacetylnitrate, an eye irritant in smog.



Predict the indicated bond angle.

- slightly less than 120°
- 120°
- 90°
- slightly less than 109.5°
- 109.5°

Question 19**1 pts**

Which of the following is a polar molecule?

 CCl_4 CO_2 XeF_2 SF_4 SO_3 **Question 20****1 pts**

Which of the following statements about polarity is FALSE?

 Dipole moments can "cancel," giving a net non-polar molecule. Linear molecules can be polar. Lone (unshared) pairs of electrons on the central atom play an important role in influencing polarity. Polar molecules must have a net dipole moment. CF_4 is a polar molecule.**Question 21****1 pts**

Which of the following molecules is nonpolar?

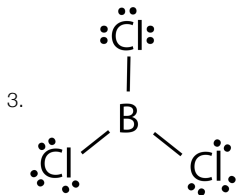
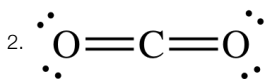
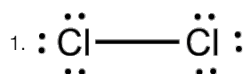
 BF_3 CH_3Br NF_3

H₂O SO₂**Question 22****1 pts**CHF₃ is (less, more) polar than CHI₃ because...

- more, the C-H bond in CHF₃ is a nonpolar bond.
- less, the three polar C-F bonds are symmetrical and cancel the dipole moments.
- less, the tetrahedral geometry decreases the polarity of C-F bonds.
- more, the C-F bonds are more polar than the C-I bonds.
- less, the C-H bond in CHF₃ is a nonpolar bond.

Question 23**1 pts**

Which of the following molecules contains polar covalent bonds but is NOT itself a polar molecule?



- 1 and 3 only
- 1 and 2 only
- 3 only

none fit the criteria

1, 2, and 3

2 and 3 only

2 only

Question 24**1 pts**

Which of the following molecules has the largest dipole moment?

HBr

HCl

F₂

HI

H₂

Question 25**1 pts**

Classify the molecule PBr₃.

polar molecule with nonpolar bonds

nonpolar molecule with polar bonds

nonpolar molecule with nonpolar bonds

polar molecule with polar bonds

Question 26**1 pts**

Which of the following combinations of hybridization and molecular geometry is possible?

- sp^3d , octahedral
- sp^2 , linear
- sp^3 , trigonal pyramidal
- sp^2 , tetrahedral

Question 27**1 pts**

The sp^3 hybridization has what percent s character and what percent p character respectively?

- 75%, 25%
- 33%, 67%
- 25%, 75%
- 50%, 50%

Question 28**1 pts**

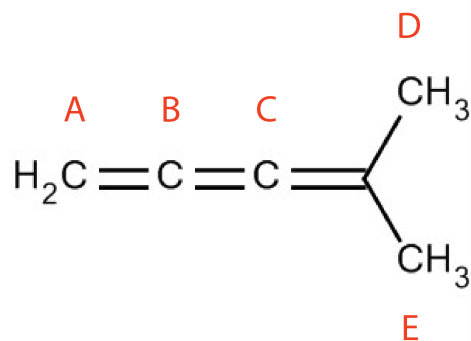
What hybridization would you expect for Se when it is found in SeO_4^{2-} ?

- sp^2
- sp^3d^2
- sp^3d
- sp^3

Question 29

1 pts

Give the hybridization of each central atom in order from A to E:



- sp³, sp², sp², sp³, sp³
- sp², sp, sp, sp³, sp³
- sp³, sp, sp, sp³, sp³
- sp², sp, sp, sp², sp²

Question 30

1 pts

What hybridization would you expect for C in ethyne (C₂H₂)?

- sp²
- sp³
- sp
- sp³d

Question 31

1 pts

sp^2 hybrid orbitals have...

- trigonal pyramidal symmetry.
- tetrahedral symmetry.
- linear symmetry.
- trigonal planar symmetry.

Not saved

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