SLE155 Chemistry for the Professional Sciences

Burwood and Geelong

Practice questions Class 2

Bonding, Lewis structure, Shapes

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The number of electron pairs around the central atom of a molecule will determine its shape.

a. True

b. False

VSEPR theory states that a molecule will adopt a shape in which electron-pair repulsions are maximised.

a. True

b. False

Dipole moments depend on molecular shape.

a. True

b. False

Bond polarity contributes to bond length.

a. True

b. False

Bond energies increase with the number of electrons shared between atoms.

a. True

b. False

Which of the options below ranks the following bonds from most polar to least polar?

Cl-O, Mg-O, O-O, C-O

a. Mg-O > Cl-O > C-O > O-O

b. Mg-O > C-O > Cl-O > O-O

c. Cl-O > C-O > Mg-O > O-O

d. Cl-O > Mg-O > C-O > O-O

e. Mg-O > Cl-O > O-O > C-O

How many valence electrons are in the phosphate ion, PO_4^{3-}?

a. 12

b. 24

c. 28

d. 32

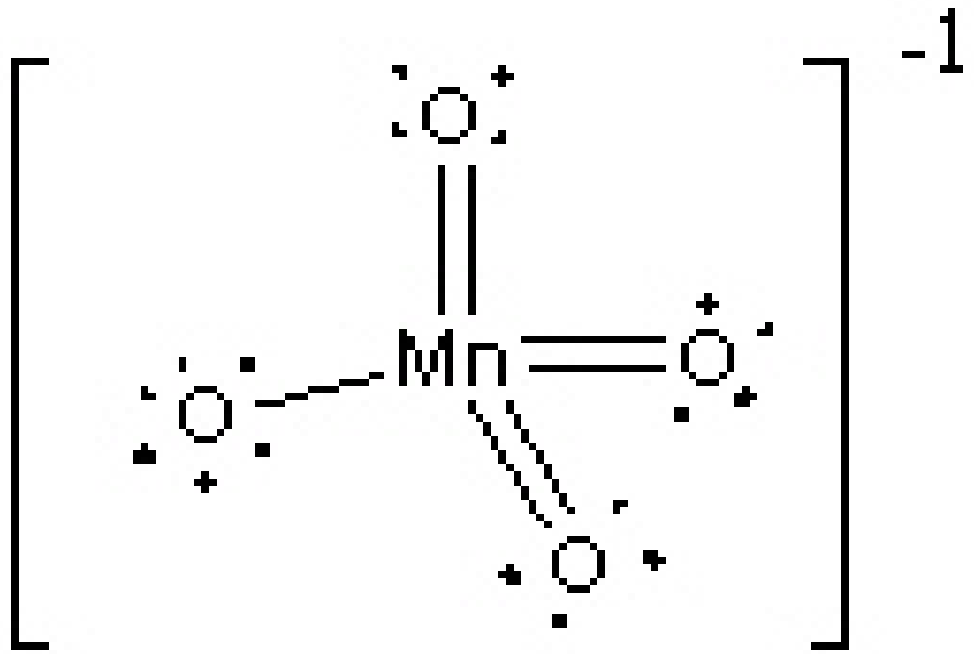
e. 36

What can you change when drawing resonance structures?

- a. total number of electrons
- b. total number atoms
- c. total number of bonds
- d. total number of protons
- e. you can change all of the above

What is the formal charge on Mn in the MnO_4^- ion?

a. 0
b. 1
c. 3
d. 5
e. 7



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Which of the following molecules has a dipole moment?

a. $SiCl_4$

b. AlI_3

c. $TeCl_4$

d. PCl_5

e. None of the above

Which of the following will not have a dipole moment?

a. SF_6

b. H_2CO

c. CH_3OH

d. H_2O

e. SF_4

Which of the following is the strongest bond?

a. C-H

b. C-C

c. C-O

d. C=C

e. C≡C

Which of the following diatomic molecules will have the largest bond length?

a. H_2

b. I_2

c. Cl_2

d. F_2

e. Br_2

Which of the following molecules would have the largest dipole moment?

a. Br2

b. H_2O

c. HF

d. F_2

e. H_2

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Hydrogen sulfide has the formula H_2S. Write the Lewis structure and state the structure of the central sulfur atom.

Draw the Lewis structure and state the molecular structure of the cental bromine atom for BrF_5.

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- Write the Lewis structure and state the molecular structure of the central atom for XeO_2F_4.

Draw the 3 most important resonance structures for the carbonate ion, CO_3^{2-}.

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