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, PO4 3-?

a. 12

b. 24

c. 28

*d. 32

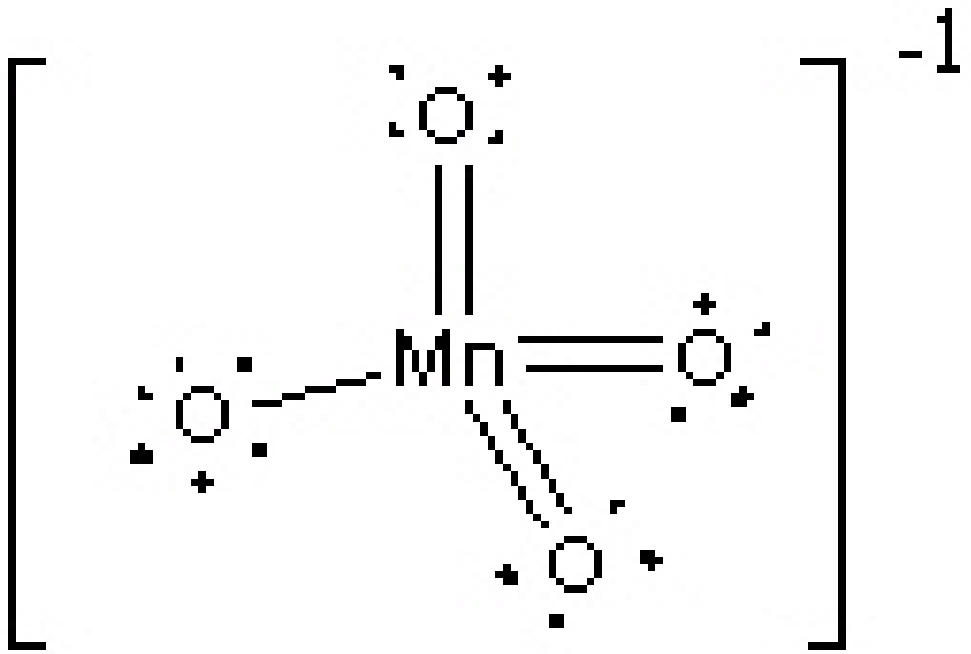
e. 36

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 MnO4- 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

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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

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

a. Br2

b. H2O

*c. HF

d. F2

e. H2

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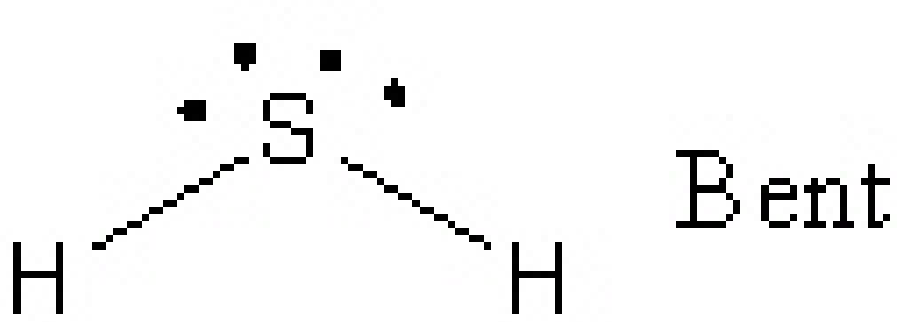
Hydrogen sulfide has the formula H2S. Write the Lewis structure and state the structure of the central sulfur atom.



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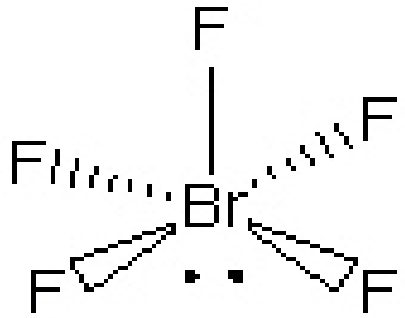
Draw the Lewis structure and state the molecular structure of the cental bromine atom for BrF5.



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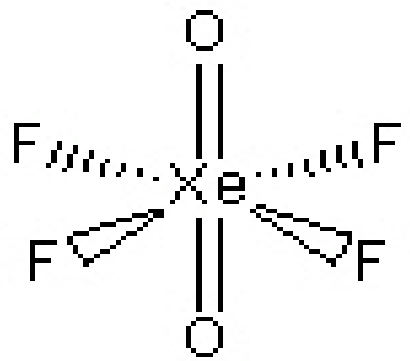
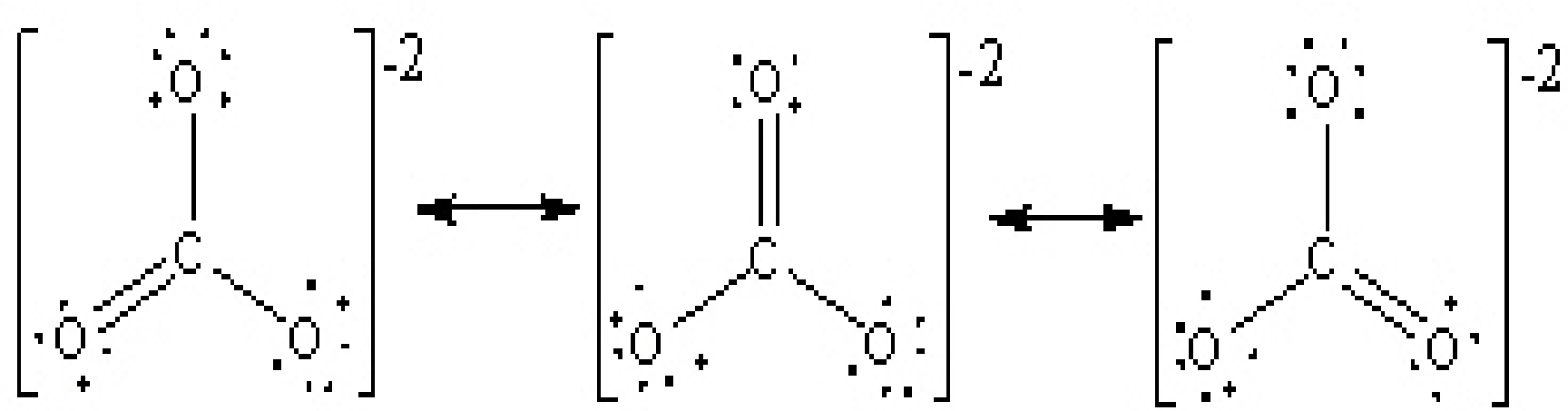
- Write the Lewis structure and state the molecular structure of the central atom for XeO2F4.



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



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