

Unit 8 Review Problems/Questions

1. Define the following:

polar molecule

nonpolar molecule

ionic bond

covalent bond

octet rule

duet rule

Intramolecular

Hydrogen Bonding

lone pairs

Intermolecular

Adhesion

Cohesion

Water's surface tension

2. Answer the following:

A) Which is an ionic bond?

NaCl, H₂O, CO₂, HBr

Why did you choose the answer that you did?

B) Which is a covalent bond?

KBr, MgO, AlN, H₂

Why did you choose the answer that you did?

C) Which of the following is more polar molecule?

C-Cl, O-F, S-Cl

Why did you choose the answer that you did?

D) Which of the following are non polar molecules?

CCl₄, NaCl, CH₃Cl, CH₄

Why did you choose the answer that you did?

E) Again, which of the following is a polar molecule?

H₂, Cl₂, HCl, CO₂

Why did you choose the answer that you did?

F) Which of the following atoms has 5 valence electrons?

F, V, N, Ne

Why did you choose the answer that you did?

G) What is the difference between a duet and an octet?

Give an example of each: Duet_____ Octet _____

H) Which of the following atoms wants to gain 2 electrons in order to form a stable octet?

C, He, Be, O

Why did you choose the answer that you did?

I) Which one of the following atoms wants to lose 1 electrons in order to form a stable octet?

F, Ar, Li, Al

Why did you choose the answer that you did?

J) Which of the following are polar molecules? (You can choose more than one)

Cl₂, F₂, HBr, O₂, CO₂, NH₃, N₂

Why did you choose the answer that you did?

K) What is the predicted shape of water (H₂O)?

Linear, Tetrahedral, Bent,

Draw the Lewis structure, the 3-D shape, and identify it as polar or non-polar.

What is the predicted shape of carbon dioxide (CO_2)?

Linear, Tetrahedral, Bent

Draw the Lewis structure, the 3-D shape, and identify it as polar or non-polar.

What is the predicted shape of ammonia (CH_4)?

Linear, Tetrahedral, Bent

Draw the Lewis structure, 3-D shape and identify the bond angle for the above molecule.

What is the predicted shape of methane (CCl_4)?

Linear, Tetrahedral, Bent

Draw the Lewis structure, 3-D shape and identify the bond angle for the above molecule.

What is the predicted shape of ozone (O_3)?

Linear, Tetrahedral, Bent

Draw the Lewis structure, 3-D shape and identify the bond angle for the above molecule.

What is the predicted shape of fluorine (F_2)?

Linear, Tetrahedral, Bent

Draw the Lewis structure, 3-D shape and identify the bond angle for the above molecule.

What is the predicted shape of sulfate $(\text{SO}_4)^{2-}$?

Linear, Tetrahedral, Bent

Draw the Lewis structure, 3-D shape and identify the bond angle for the above molecule.

Why is water necessary for life on earth?

[illegible]