U4B – Nomenclature & Bonding TWITTER Review

U4B-1: Describe the bond formed in the following:
A) K3P
B) SO2
C) Br2

- Answer: A) Ionic bond B) Polar Covalent C) Non-polar Covalent

U4B-2: A bond formed between two atoms with a change in electronegativity of 1.4 is what type of bond?

- Answer: polar covalent bond

U4B-3: Why is electronegativity important in determining polarity?

- Answer: change in electronegativity can be used to determine BOND polarity

U4B-4: Order the covalent bond lengths from shortest to longest.

- Answer: triple < double < single

U4B-5: Order the covalent bond strengths from weakest to strongest.

- Answer: single < double < triple

U4B-6: Explain why resonance is shown for a molecule's Lewis structure.

- Answer: Electrons constantly shift around the central atom. Therefore, resonance is shown to represent the same molecule due to the movement and placement of electrons in a DOUBLE BOND around the central atom.

U4B-7: What does VSEPR stand for?

- Answer: Valence Shell Electron Pair Repulsion

U4B-8: According to VSEPR theory, what determines the shape of molecules?

- Answer: electrostatic repulsion between shared (covalent bonds) and unshared (lone) pairs of electrons around the central atom that are separated as far as possible, thus producing molecular shape and bond angles.

U4B-9:
A) Polar molecules have a(n) _____ distribution of charge/e-.
B) Non-polar molecules have a(n) _____ distribution of charge/e-.

- Answer: A) unequal/asymmetrical B) equal/symmetrical

U4B-10: Which molecule contains a double covalent bond between its atoms?
A) F2
B) N2
C) O2
D) Br2

- Answer: C) O_2

U4B-11: Which molecule has a symmetrical shape (molecular geometry)?
A) Br2
B) NH3
C) H2O
D) SO2

- Answer: A) Br_2

U4B-12: Which compound only contains ionic bonds?
A) BaCl2
B) CH3OH
C) CO2
D) BF3

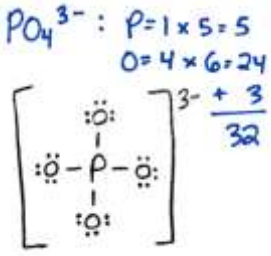
- Answer: A) $BaCl_2$

U4B-13: Which compound only contains covalent bonds?
A) Na3P
B) CCl4
C) LiF
D) CaO

- Answer: B) CCl_4

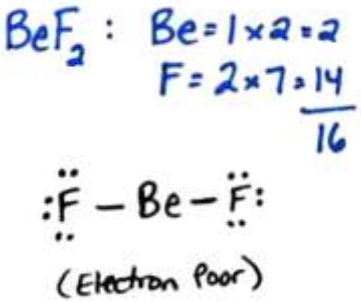
U4B-14: Draw the Lewis structure of (PO4)^3-

- Answer: L.S. of PO_4^{3-}



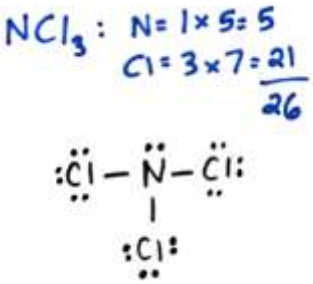
U4B-15: Draw the Lewis structure of BeF2

- Answer: L.S. of BeF_2



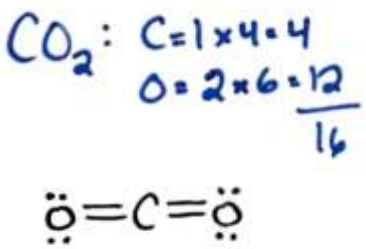
U4B-16: Draw the Lewis structure of NCl3

- Answer: L.S. of NCl_3



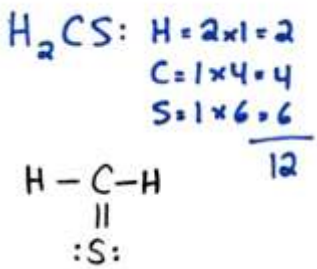
U4B-17: Draw the Lewis structure of CO2

- Answer: L.S. of CO_2



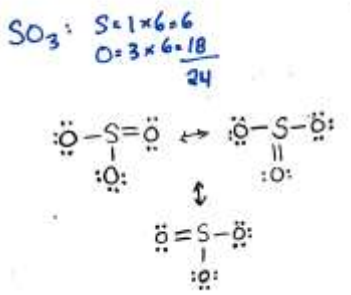
U4B-18: Draw the Lewis structure of H2CS

- Answer: L.S. of H_2CS



U4B-19: Draw the Lewis structure of SO3

- Answer: L.S. of SO_3



U4B-20: Determine the shape (MG) of sulfate.

- Answer: SO_4^{2-} = tetrahedral

U4B-21: Determine the shape (MG) of phosphorus trifluoride.

- Answer: PF_3 = trigonal pyramidal

U4B-22: Determine the shape (MG) of carbonate.

- Answer: CO_3^{2-} = trigonal planar

U4B-23: Determine the shape (MG) of sulfur dichloride.

- Answer: SCl_2 = bent

U4B-24:
A) Is ammonia (NH3) polar, non-polar, or an ion?
B) Explain why?

- Answer: A) NH_3 = polar B) lone pair on central atom

U4B-25:
A) Is ammonium (NH4^+) polar, non-polar, or an ion?
B) Explain why?

- Answer: A) NH_4^+ = ion B) molecule has net charge of +1

U4B-26:
A) Is CH2O polar, non-polar, or an ion?
B) Explain why?

- Answer: A) CH_2O = polar B) different terminal atoms & different bonds around central atom

U4B-27:
A) Is BCl3 polar, non-polar, or an ion?
B) Explain why?

- Answer: A) BCl_3 = non-polar B) no lone pairs on central atom / all terminal atoms identical / identical bonds

U4B-28: How many valence electrons does phosphite (PO3)^3- have?

- Answer: PO_3^{3-} = 26 ve-

U4B-29: How many valence electrons does CCl4 have?

- Answer: CCl_4 = 32 ve-

U4B-30: How many valence electrons does (NH4)^+ have?

- Answer: NH_4^+ = 8 ve-

U4B-31: Explain why subscripts of an ionic compound are reduced/simplified.

- Answer: reduced to show simplest NEUTRAL ratio of combined ions

U4B-32: If two atoms have the same electronegativities, what must be true about the bond between them?

- Answer: bond must be non-polar

U4B-33: What is true about changing the subscripts of a correctly written chemical formula or if the subscripts are incorrect?

- Answer: changing subscripts of a formula changes formula so that it no longer represents that chemical compound

U4B-34: Answer in regards to dipoles:
A) Towards what atom does a dipole point? More electronegative or less electronegative?
B) Explain why

- Answer: A) Dipole → more electronegative atom B) greater E.N. has a greater attraction for e-

U4B-35: How many covalent bonds are formed between two chlorine atoms?

- Answer: Cl_2 → 1 covalent bond formed

U4B-36: How many atoms of chlorine are present in a molecule of phosphorus pentachloride?

- Answer: PCl_5 → 5 atoms of Cl

U4B-37:
A) CaO =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Calcium Oxide ; ionic

U4B-38:
A) MgI2 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Magnesium Iodide ; ionic

U4B-39:
A) CuO2 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Copper (IV) Oxide ; ionic

U4B-40:
A) Potassium Sulfide =
B) Ionic / Covalent (molecular) / Acid?

- Answer: K_2S ; ionic

U4B-41:
A) Iron (III) Nitride =
B) Ionic / Covalent (molecular) / Acid?

- Answer: FeN ; ionic

U4B-42:
A) Manganese (IV) Fluoride =
B) Ionic / Covalent (molecular) / Acid?

- Answer: MnF_4 ; ionic

U4B-43:
A) CdSO3 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Cadmium Sulfite ; ionic

U4B-44:
A) $CuSO4$ =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Copper (II) Sulfate ; ionic

U4B-45:
A) $NaHCO3$ =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Sodium Bicarbonate OR Sodium Hydrogen Carbonate ; ionic

U4B-46:
A) Calcium Carbonate =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $CaCO_3$; ionic

U4B-47:
A) Cobalt (II) Sulfate =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $CoSO_4$; ionic

U4B-48:
A) Cesium Nitrite =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $CsNO_2$; ionic

U4B-49:
A) HBr =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Hydrobromic Acid ; acid

U4B-50:
A) $H2S$ =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Hydrosulfuric Acid ; acid

U4B-51:
A) $HNO3$ =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Nitric Acid ; acid

U4B-52:
A) Carbonic Acid =
B) Ionic / Covalent (molecular) / Acid?

- Answer: H_2CO_3 ; acid

U4B-53:
A) Acetic Acid =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $HC_2H_3O_2$; acid

U4B-54:
A) Phosphorous Acid =
B) Ionic / Covalent (molecular) / Acid?

- Answer: H_3PO_3 ; acid

U4B-55:
A) HNO3 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Nitric Acid ; acid

U4B-56:
A) HClO2 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Chlorous Acid ; acid

U4B-57:
A) HClO4 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Perchloric Acid ; acid

U4B-58:
A) Phosphorus Pentoxide =
B) Ionic / Covalent (molecular) / Acid?

- Answer: PO_5 ; covalent (molecular)

U4B-59:
A) Silicon Tetrachloride =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $SiCl_4$; covalent (molecular)

U4B-60:
A) Dinitrogen Trioxide =
B) Ionic / Covalent (molecular) / Acid?

- Answer: N_2O_3 ; covalent (molecular)

U4B-61:
A) SCl2 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Sulfur Dichloride ; covalent (molecular)

U4B-62:
A) PCl5 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Phosphorus Pentachloride ; covalent (molecular)

U4B-63:
A) SO4 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Sulfur Tetroxide ; covalent (molecular)

U4B-64:
A) NH4OH =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Ammonium Hydroxide ; ionic (base)

U4B-65:
A) Ba(OH)2 =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Barium Hydroxide ; ionic (base)

U4B-66:
A) Barium Sulfite =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $BaSO_3$; ionic

U4B-67:
A) Iron (III) Sulfide =
B) Ionic / Covalent (molecular) / Acid?

- Answer: Fe_2S_3 ; ionic

U4B-68:
A) Carbon Tetrafluoride =
B) Ionic / Covalent (molecular) / Acid?

- Answer: CF_4 ; covalent (molecular)

U4B-69:
A) Tin (II) Iodide =
B) Ionic / Covalent (molecular) / Acid?

- Answer: SnI_2 ; ionic

U4B-70:
A) Silver Nitrate =
B) Ionic / Covalent (molecular) / Acid?

- Answer: $AgNO_3$; ionic