Quiz 7A

1. Determine the total number of valence electrons in each of the following (4 points):
	1. H2S

$$\left(\frac{1 VE}{H atom}\right)\left(2 H atoms\right)+\left(\frac{6 VE}{S atom}\right)\left(1 S atom\right)=8 VE$$

* 1. CCl4

$$\left(\frac{4 VE}{C atom}\right)\left(1 C atom\right)+\left(\frac{7 VE}{Cl atom}\right)\left(4 Cl atoms\right)=32 VE$$

* 1. OH-

$$\left(\frac{8 VE}{O atom}\right)\left(1 O atom\right)+\left(\frac{1 VE}{H atom}\right)\left(1 H atom\right)+e^{-}=8 VE$$

* 1. CH3OH

$$\left(\frac{4 VE}{C atom}\right)\left(1 C atom\right)+\left(\frac{1 VE}{H atom}\right)\left(4 H atom\right)+\left(\frac{6 VE}{O atom}\right)(1 O atom)=14 VE$$

1. Is this week’s lab a wet lab or a dry lab? Dry lab
2. If the available valence electrons for a molecule or polyatomic ion do not complete all of the octets in an electron-dot formula, what should you do (2 points)?

You should form multiple bonds between atoms.

1. Predict whether each of the following bonds is ionic, polar covalent, or nonpolar covalent (4 points).
	1. Si-Br polar covalent
	2. Li-F ionic
	3. Br-F polar covalent
	4. Br-Br nonpolar covalent
2. Identify the major type of interactive force (ionic, London force, dipole force or hydrogen bond) in each of the following substances (4 points):
	1. BrF dipole force
	2. KCl ionic
	3. CCl4 London force
	4. HF hydrogen bond
3. Answer the following questions about the reaction below (5 points):

CH4 (g) + 2 O2 (g) 🡪 CO2 (g) + 2 H2O (l) + 890 kJ

* 1. Is this an exothermic or endothermic reaction? Exothermic
	2. If 12.5 g of oxygen gas react with excess methane gas, how many joules of heat are released?

$12.5 g O\_{2}×\frac{1 mol O\_{2} }{32.00 g O\_{2}}×\frac{890 kJ}{2 mol O\_{2}}×\frac{1000 J}{1 kJ}=1.74×10^{4} J released or-1.74×10^{4} J$

Quiz 7B

1. Determine the total number of valence electrons in each of the following (4 points):
	1. I2 $\left(\frac{7 VE}{I atom}\right)\left(2 I atoms\right)=14 VE$
	2. SBr2 $\left(\frac{6 VE}{S atom}\right)\left(1 S atoms\right)+\left(\frac{7 VE}{Br atom}\right)\left(2 Br atom\right)=20 VE$
	3. BH4- $\left(\frac{3 VE}{B atom}\right)\left(1 B atoms\right)+\left(\frac{1 VE}{H atom}\right)\left(4 H atom\right)+e^{-}=8 VE$
	4. CH3CO2H

$$\left(\frac{4 VE}{C atom}\right)\left(2 C atom\right)+\left(\frac{1 VE}{H atom}\right)\left(4 H atom\right)+\left(\frac{6 VE}{O atom}\right)(2 O atom)=24 VE$$

1. Answer the following questions about the reaction below (5 points):

2 P (s) + 3 Cl2 (g) 🡪 2 PCl3 (l) + 2 H2O (l) + 641 kJ

* 1. Is this an exothermic or endothermic reaction? Exothermic
	2. If 9.517 g of phosphorus powder react with excess chlorine gas, how many joules of heat are released?

$$9.517 g P×\frac{1 mol P }{30.97 g P}×\frac{641 kJ}{2 mol P}×\frac{1000 J}{1 kJ}=9.849 ×10^{4} J released or-9.849×10^{4} J$$

1. Identify the major type of interactive force (ionic, London force, dipole force or hydrogen bond) in each of the following substances (4 points):
	1. Cl2 London force
	2. CH3OH hydrogen bond
	3. Na2O ionic
	4. HCl dipole force
2. When is it necessary to write a multiple bond in an electron-dot formula (2 points)?

When using all the valence electrons does not give complete octets, it is necessary to write multiple bonds.

1. Predict whether each of the following bonds is ionic, polar covalent, or nonpolar covalent (4 points).
	1. N-P polar covalent
	2. C-F polar covalent
	3. Li-O ionic
	4. H-H nonpolar covalent
2. Is this week’s lab a wet lab or a dry lab (1 point)? Dry lab