Name ANSWERS Date_____ Period_____

Polarity & Electronegativity Worksheet

1. What does it mean to say a bond is polar?

   uneven sharing of e^- in a bond

2. How are ionic bonds and covalent bonds different?

   ionic: gain/lose e^-
   covalent: share e^-

3. How does a polar covalent bond differ from a non-polar covalent bond?

   polar covalent: ΔEN 0.4-1.7
   non-polar covalent: ΔEN 0.1-0.4

4. How do electronegativity values help us determine the type of bond created?

   EN shows how e^- are shared in a bond

5. For each of the following molecules, determine if it is covalent, polar, or ionic. **Show your work by listing the electronegativities of each element in the bond.**

Molecule	Electronegativity Values	Difference in Electronegativity	Bond Type
H – Cl	H: 2.20 Cl: 3.16	0.96	polar
H – H	H: 2.20 H: 2.20	0	pure
H - I	H: 2.20 I: 2.66	0.46	polar
Cl - Cl	Cl: 3.16 Cl: 3.16	0	pure
C – O	C: 2.55 O: 3.44	0.89	polar
Ca – O	Ca: 1.00 O: 3.44	2.44	ionic
H_2O	H: 2.20 O: 3.44	1.24	polar
Al – Fe	Al: 1.61 Fe: 1.83	0.22	

6. For each of the following sets of elements, identify the element expected to be most electronegative (EN) and which is expected to be least **electronegative (EN).**

   a. K, Sc, Ca most EN= Sc least EN= K

   b. Br, F, At most EN= F least EN= At

   c. C, O, N most EN= O least EN= C

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7. Complete the following table.

Bond	Δ EN	Type of Bond (ionic, pc, np, pure)	Diagram (show partial charges and dipole moments if applicable)
C -- O	O 3.44 C 2.55 0.89	pc	$\delta^+ C \xrightarrow{} O^{\delta-}$
S -- Cl	Cl 3.16 S 2.58 0.58	pc	$\delta^+ S \xrightarrow{} Cl^{\delta-}$
P -- I	I 2.66 P 2.19 0.47	pc	$\delta^+ P \xrightarrow{} I^{\delta-}$
F -- I	F 3.98 I 2.66 1.32	pc	$\delta^- F \xleftarrow{} I^{\delta+}$
N -- O	O 3.44 N 3.04 0.40	pc	$\delta^+ N \xrightarrow{} O^{\delta-}$
P -- Br	Br 2.96 P 2.19 0.77	pc	$\delta^+ P \xrightarrow{} Br^{\delta-}$
C -- I	I 2.66 C 2.55 0.11	np	$\delta^+ C - I^{\delta-}$
H -- O	O 3.44 H 2.20 1.24	pc	$\delta^+ H \xrightarrow{} O^{\delta-}$
N -- Cl	Cl 3.16 N 3.04 0.12	np	$\delta^+ N - Cl^{\delta-}$
O -- I	O 3.44 I 2.66 0.78	pc	$\delta^- O \xleftarrow{} I^{\delta+}$