

WKS
Bond Polarity

NAME Answer Key
Period _____ Date _____

- What is electronegativity?
The tendency of an atom to attract electrons in a bond.
- What is bond polarity?
The separation of charge caused by the unequal sharing of electrons.
- How is bond polarity determined?
By determining the difference in electronegativity (ΔEN) between the atoms in the bond.
- What is a non-polar covalent bond? Give two examples of a non-polar covalent bond.
A bond in which electrons are shared equally. C-C, C-H, H-H, O-O, N-Cl
- What electronegativity difference (ΔEN) indicates a non-polar covalent bond? $0 - 0.4$
- What is a polar covalent bond? Give two examples of a polar covalent bond.
A bond in which electrons are shared unequally. C-O, C-N, O-H, N-H, O-N, O-F, H-F
- What electronegativity difference (ΔEN) indicates a polar covalent bond? >0.4 to 2.0
- What electronegativity difference (ΔEN) indicates an ionic bond? >2.0
- For the following bonds, use the electronegativity table to indicate ΔEN for each bond (SHOW WORK!) and indicate its polarity. **If the bond is polar covalent, indicate the presence of the dipole using either the arrow or the δ^+/δ^- symbols. If it is ionic, put in the charges.**

<p>(a) $\overset{\text{+}}{\text{N}}-\overset{\text{-}}{\text{F}}$ $\Delta EN = \underline{4.0 - 3.0 = 1.0}$ or $\overset{\delta^+}{\text{N}}-\overset{\delta^-}{\text{F}}$ Polarity: <u>Polar Covalent</u></p>	<p>(b) $\overset{\text{-}}{\text{N}}-\overset{\text{+}}{\text{C}}$ $\Delta EN = \underline{3.0 - 2.5 = 0.5}$ or $\overset{\delta^-}{\text{N}}-\overset{\delta^+}{\text{C}}$ Polarity: <u>Polar Covalent</u></p>
<p>(c) $\overset{\text{-}}{\text{O}}-\overset{\text{+}}{\text{I}}$ $\Delta EN = \underline{3.5 - 2.5 = 1.0}$ or $\overset{\delta^-}{\text{O}}-\overset{\delta^+}{\text{I}}$ Polarity: <u>Polar Covalent</u></p>	<p>(d) <u><none></u> P-H $\Delta EN = \underline{2.1 - 2.1 = 0.0}$ Polarity: <u>Nonpolar Covalent</u></p>
<p>(e) $\overset{\text{+}}{\text{K}}-\overset{\text{-}}{\text{F}}$ $\Delta EN = \underline{4.0 - 0.8 = 3.2}$ Polarity: <u>Ionic</u></p>	<p>(f) $\overset{\text{-}}{\text{O}}-\overset{\text{+}}{\text{Si}}$ $\Delta EN = \underline{3.5 - 1.8 = 1.7}$ or $\overset{\delta^-}{\text{O}}-\overset{\delta^+}{\text{Si}}$ Polarity: <u>Polar Covalent</u></p>
<p>(g) <u><none></u> Cl-N $\Delta EN = \underline{3.0 - 3.0 = 0.0}$ Polarity: <u>Nonpolar Covalent</u></p>	<p>(h) $\overset{\text{2-}}{\text{O}}-\overset{\text{2+}}{\text{Mg}}$ $\Delta EN = \underline{3.5 - 1.2 = 2.3}$ Polarity: <u>Ionic</u></p>