

Key

### Covalent (Non-Polar/Polar) and Ionic Bonds

Determine the type (non-polar covalent, polar covalent, or ionic) and the polarity (ie. which end is negative and which is positive) for each of the following:

	TYPE	POLARITY
1. K and Cl in KCl	ionic	$\oplus\text{K} - \text{Cl}\ominus$
2. C and Cl in $\text{CCl}_4$	polar covalent	$\gamma^+ \text{C} - \text{Cl}(\gamma^-)$
3. Cl and Cl in $\text{Cl}_2$	non-polar covalent	$\text{Cl} - \text{Cl}$
4. S and O in $\text{SO}_3$	<u>polar covalent</u>	$\delta^+ \text{S} - \text{O} \delta^-$
5. Sn and S in $\text{SnSO}_4$	<u>IONIC</u>	$\oplus \text{Sn} - \text{SO}_4 \ominus$
6. Na and N in $\text{NaNO}_3$	<u>IONIC</u>	$\oplus \text{Na} - \text{NO}_3 \ominus$
7. Cu and O in CuO	<u>polar covalent</u>	$\delta^+ \text{Cu} - \text{O} \delta^-$
8. Mn and S in $\text{MnS}_2$	<u>polar covalent</u>	$\delta^+ \text{Mn} - \text{S} \delta^-$
9. As and O in $\text{AsO}_3$	<u>polar covalent</u>	$\delta^+ \text{As} - \text{O} \delta^-$
10. Si and O in $\text{SiO}_2$	<u>IONIC</u>	$\oplus \text{Si} - \text{O} \ominus$
11. N and H in $\text{NH}_3$	<u>polar covalent</u>	$\delta^- \text{N} - \text{H} \delta^+$
12. Se and F in $\text{SeF}_4$	<u>polar covalent</u>	$\delta^+ \text{Se} - \text{F} \delta^-$
13. Bi and Cl in $\text{BiCl}_3$	<u>polar covalent</u>	$\delta^+ \text{Bi} - \text{Cl} \delta^-$
14. N and I in $\text{NI}_3$	<u>polar covalent</u>	$\delta^- \text{N} - \text{I} \delta^+$
15. P and H in $\text{PH}_3$	<u>non-polar covalent</u>	$\text{P} - \text{H}$
16. Ca and S in CaS	<u>polar covalent</u>	$\delta^+ \text{Ca} - \text{S} \delta^-$
17. Al and S in $\text{Al}_2\text{S}_3$	<u>polar covalent</u>	$\delta^+ \text{Al} - \text{S} \delta^-$
18. As and Cl in $\text{AsCl}_3$	<u>polar covalent</u>	$\delta^+ \text{As} - \text{Cl} \delta^-$
19. H and H in $\text{H}_2$	<u>non-polar covalent</u>	$\text{H} - \text{H}$
20. O and H in $\text{H}_2\text{O}$	<u>polar covalent</u>	$\delta^- \text{O} - \text{H} \delta^+$

$\gamma$   
indicates  
partial  
charge