Types of Chemical Bonds

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Chemistry	**Crash Course Chemistry #22**	**9:45**	**ScreenApp**

Cues and Questions	Notes
Why do atoms form bonds?	To lower their overall energy, reaching a balance between attraction and repulsion.
What happens as two atoms approach?	Each atom's electrons are pulled toward the other atom's protons, drawing the atoms closer.
What is bond length?	The distance between two nuclei at minimum energy, where attraction and repulsion balance. Too close: the nuclei repel. Too far: the energy rises.
What is a covalent bond?	Electrons are shared and spend most of their time between the two nuclei.
What is electronegativity?	How strongly an atom holds on to shared electrons.
Polar vs non-polar covalent	Polar: uneven sharing, slight negative and positive ends. Non-polar: even or nearly even sharing, e.g. Cl2.
What is an ionic bond?	Metals lose outer electrons and become positive ions. Positive and negative ions attract.
What does Coulomb's law give?	The energy between two ions at a given distance. It needs ion charges, so it fits ionic bonds.
Ionic vs covalent compounds	Ionic: often crystalline, often dissolve in water, conduct when dissolved. Covalent: softer solids, liquids or gases, solutions do not conduct.

Summary

Atoms bond to reach a lower energy balance between attraction and repulsion. Covalent bonds share electrons, evenly or unevenly depending on electronegativity. Ionic bonds come from electrons moving between atoms, and Coulomb's law describes the attraction between the ions. Bond types sit on a continuum, and polarity explains why ionic and covalent compounds behave differently.

Review Questions

1. Why do atoms form bonds, and what determines a bond length?
2. How does electronegativity affect whether a covalent bond is polar or non-polar?
3. How does an ionic bond form, and why can Coulomb's law be used to calculate its energy?
4. What are some typical differences between ionic and covalent compounds?

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