Carboxylic acids are the organic acids. Amines are the organic bases. They react in a reaction that goes to completion.

Carboxylic acids are weaker acids than H$_3$O$^\circ$. Amines are weaker bases than $\Theta$OH.

\[
\begin{align*}
\text{acid} & \overset{\text{+ base}}{\longrightarrow} \text{Rxn goes to completion.}
\end{align*}
\]

Dipole Moment ($\mu$) \[\mu = q \times r\]

\[
\begin{align*}
\text{H-F} & \quad 1.81 \text{ D} \\
\text{H-Cl} & \quad 1.08 \text{ D} \\
\text{H-Br} & \quad 0.80 \text{ D} \\
\text{H-I} & \quad 0.46 \text{ D}
\end{align*}
\]

Bond lengths increase down the series (H-I greatest), but the electronegativity decreases down the series. Electronegativity is the dominant effect in the $\mu$ values for this series.
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DO NOT STAPLE

Alkenes

\[ \ce{C=C} \]

no free rotation
planar

\[ \ce{C=C} \]

\[ \ce{C=C} \]

\[ \ce{C=C} \]

BAD
implies nonplanar structure

Priority Rules for Naming Stereoisomers

1) Highest priority is highest atomic #
2) If atomic # is the same, go to the next atom the highest priority

Zusammen (Z) = together (same side of the double bond)
entgegen (E) = opposite (different sides of the double bond)
Electrophilic Addition

H-Cl, H-Br, H-I

Essentially the same mechanism

Always get the more substituted alkyl halide.

Carbocation stability: \(3^\circ > 2^\circ > 1^\circ\)
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Since both possible carbocations are 2°, they are nearly identical in energy. Neither is favored over the other, so both are formed and the rxn results in a mixture of two products:

Central double bond of reagent is more nucleophilic (more reactive).

Order of Cation Stability

CH₃-C⁺ > CH₃-C⁺ > CH₃-C⁺-H > CH₃⁺

Common intermediates difficult to form