Acid-Base/Acid-Salt Reactions

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You are given hydrochloric acid and sodium hydroxide solution. Write out the molecular, total ionic, and net ionic equations. What happens to the conductivity of this solution?

Molecular Equation: $HCL\ (aq) + NaOH\ (aq) \rightarrow NaCl\ (s) + H_2O\ (l)$

Total Ionic Equation: $H^+ + Cl^- + Na^+ + OH^- \rightarrow Na^+ + Cl^- + H_2O$

Net Ionic Equation: $H^+ + OH^- \rightarrow H_2O$

Steps:

1) Double replacement, aka "Innies with Innies, Outies with Outies."
2) Then balance out the equation to get the **Molecular Equation** (ask yourself: Are there the same amount of each element on both sides of the equation?)"
3) Now get your solubility rules, and ask yourself about each compound:
    a) Is it soluble?
    b) Does it dissociate; break up into ions?
    c) Trick question: Is _____ acid soluble? Answer: **ALL** acids are soluble, but **not all** acids **DISSOCIATE**! Only **STRONG** acids **DISSOCIATE** (break up into ions)
4) Now you have your **Total Ionic Equation**. At this point, it is possible to determine the **conductivity** of the solution. In this case, since there are **fewer ions on the right** side of the equation than the left side, the solution has become **LESS** conductive. Fewer ions on the right side than the left side means less conductivity.
5) In order to get the net ionic equation, the spectator ions must be removed. There are ions that are present in both sides of the equation (for this example, the spectator ions are Na^+ and Cl^-).
6) If there are no spectator ions, the net ionic equation is the same as the total ionic equation.