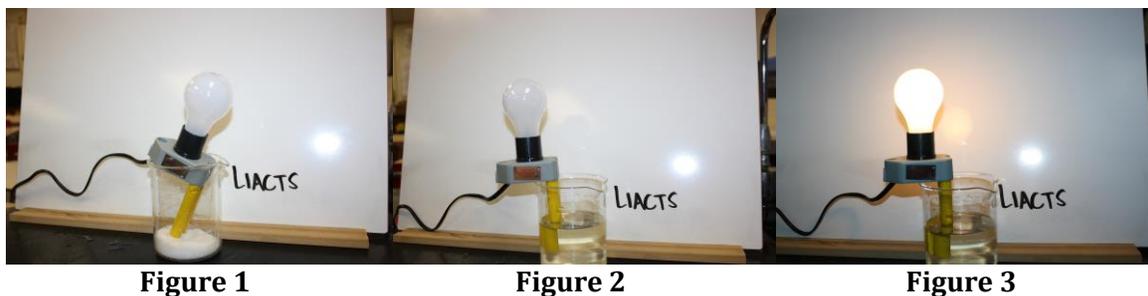


What Lights Me Up!?!

Background:

A conductivity tester lights up when the two electrodes are both in contact with a conducting material. All substances below were tested using a conductivity apparatus at 25 °C. In Figure 1, the device was inserted into granulated sodium chloride and the light bulb did not light up. In Figure 2, the device was inserted into deionized water and the light bulb still did not light. Finally, in Figure 3, the apparatus was inserted into a solution containing 117g of sodium chloride to 200mL of water and a bright light will be observed. After the sodium chloride dissolves, the temperature of the solution is 19°C.

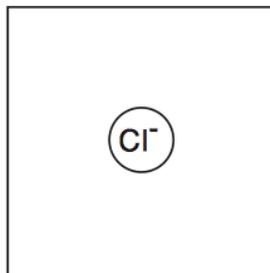


Applications:

1. Identify the type of bonding in H_2O .
2. Identify the type of bonding in NaCl .
3. State, in terms of charged particles, why $\text{NaCl}_{(\text{aq})}$ conducts electricity and $\text{NaCl}_{(\text{s})}$ does not.
4. Identify an ion that will produce a precipitate when combined with chloride ions.
5. Calculate the number of moles of sodium chloride added to the water. Your answer must include the correct numerical setup as well as the calculated answer.
6. Calculate the molarity of the salt solution. Your answer must include the correct numerical setup as well as the calculated answer.

7. Use the key to draw two water molecules in the box showing the correct orientation of each water molecule toward the chloride ion.

Key	
●	= hydrogen atom
○	= oxygen atom
●● ○	= water molecule



8. Based on Reference Table G, what type of solution is formed when 30g of NaCl is dissolved 100g of water at 40°C?

9. The following equation shows the dissolving of NaCl in water: $\text{NaCl}(s) \xrightarrow{\text{H}_2\text{O}} \text{Na}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
identify whether the process is endothermic or exothermic and state evidence to support your answer.

10. Draw the Lewis Dot diagram for NaCl.

Answer Key:

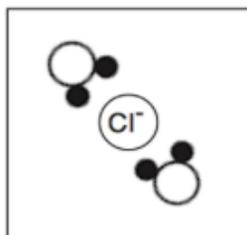
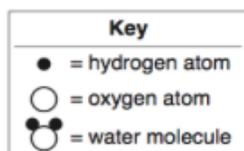
1. Covalent Bonding or Polar Covalent
2. Ionic Bonding
3. The aqueous solution has mobile charged particles.
4. Ag^+ Hg_2^{2+} Pb^{2+}

5. $\text{mols} = \frac{117 \text{ g}}{58 \text{ g/mol}}$

2.02 mols

6. $\text{Molarity} = \frac{2.02 \text{ mols}}{0.2 \text{ L}}$
 $= 10.1 \text{ M}$

7.



8. Unsaturated
9. Endothermic because the temperature went down.

