

***Combining Chemistry with Art:
Employing Acid-Base Indicators to
Illustrate the Electrolysis of Water***

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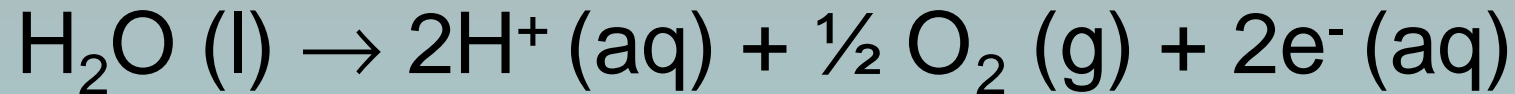


Teaching Goals

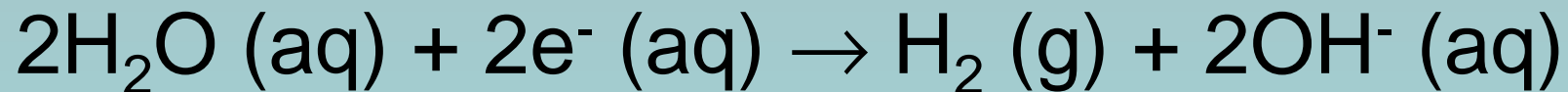
- To make chemistry more relevant for undergraduate and high school students
- To illustrate the electrolytic cathode and anode reactions
- To demonstrate the pH changes resulting from the electrolysis products

Electrode Reactions

- Oxidation reaction at anode,



- Reduction reaction at cathode,

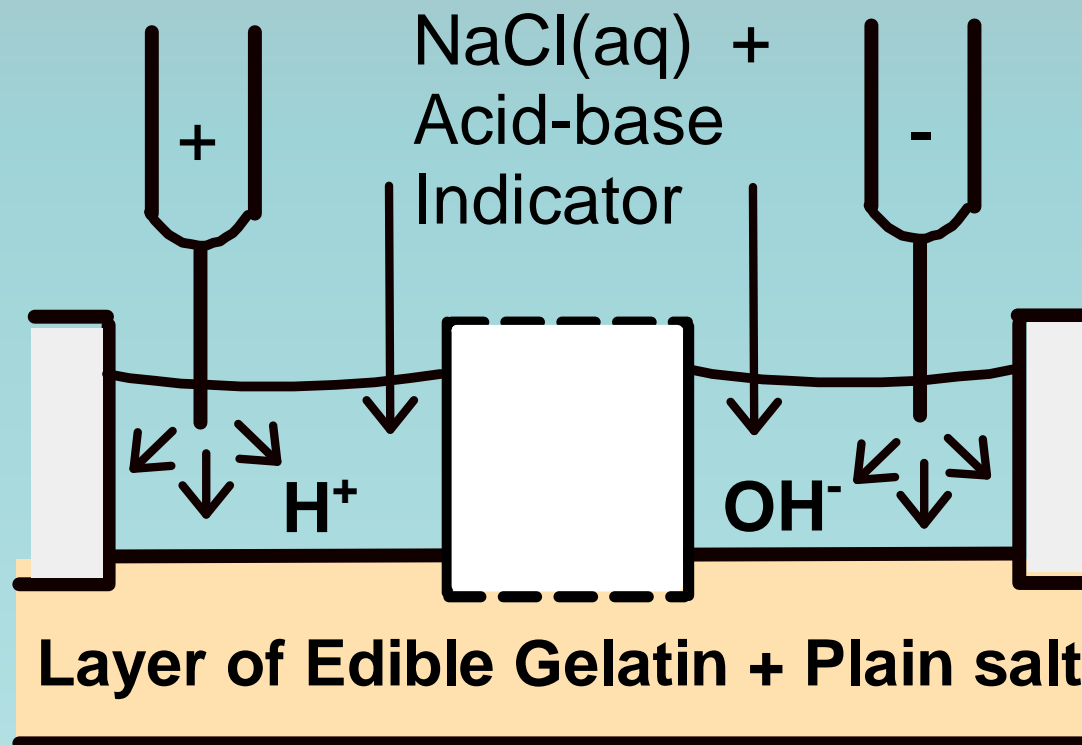


Demonstration 1: Material

- Vegetable cutting board
- Table salt
- Gelatin
- Platinum electrodes
- Acid-base indicators (phenolphthalein, thymolphthalein, and bromothymol blue)
- 9 V batteries

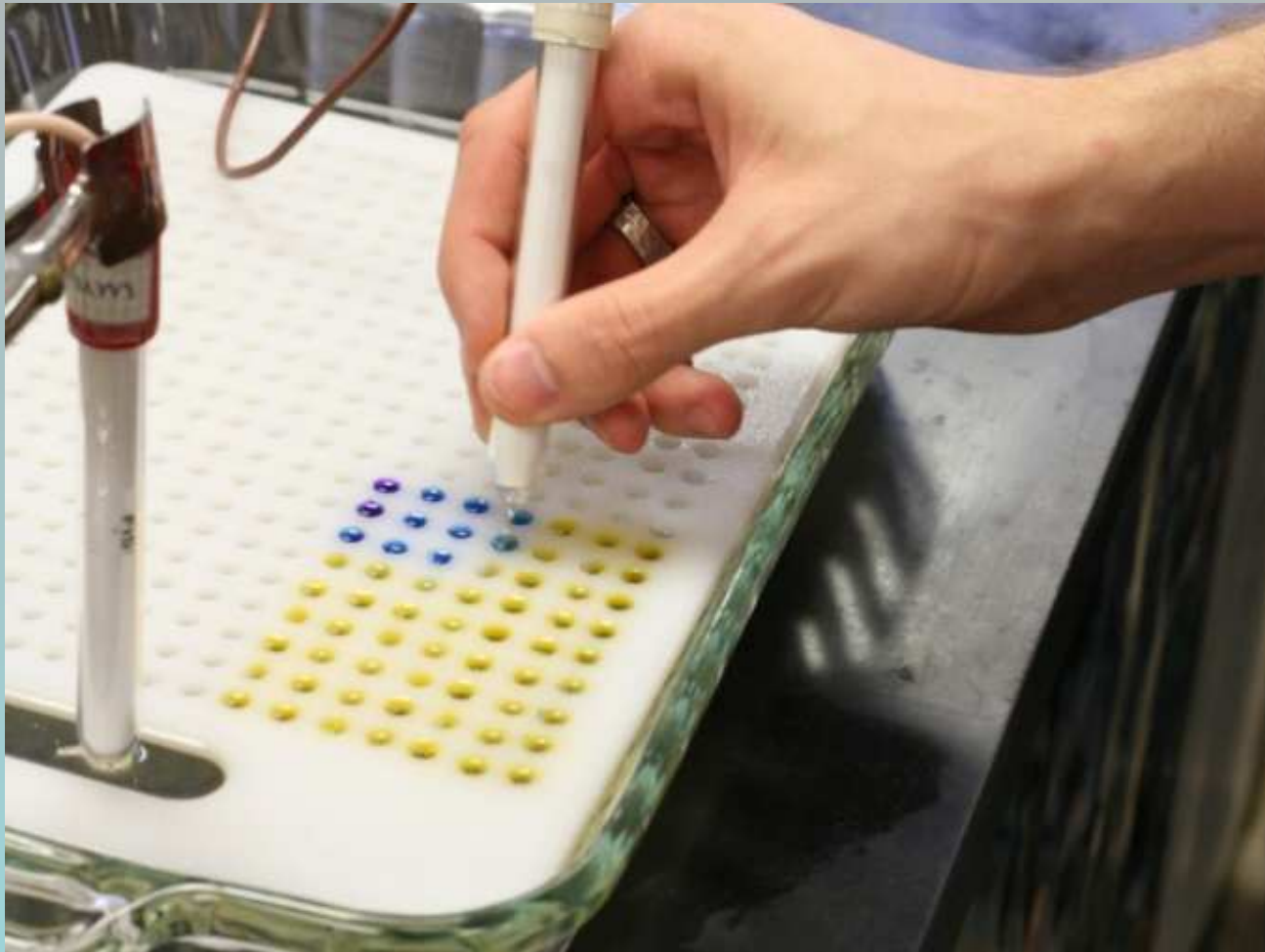


Schematic Diagram of the Electrolysis Cell



Setup

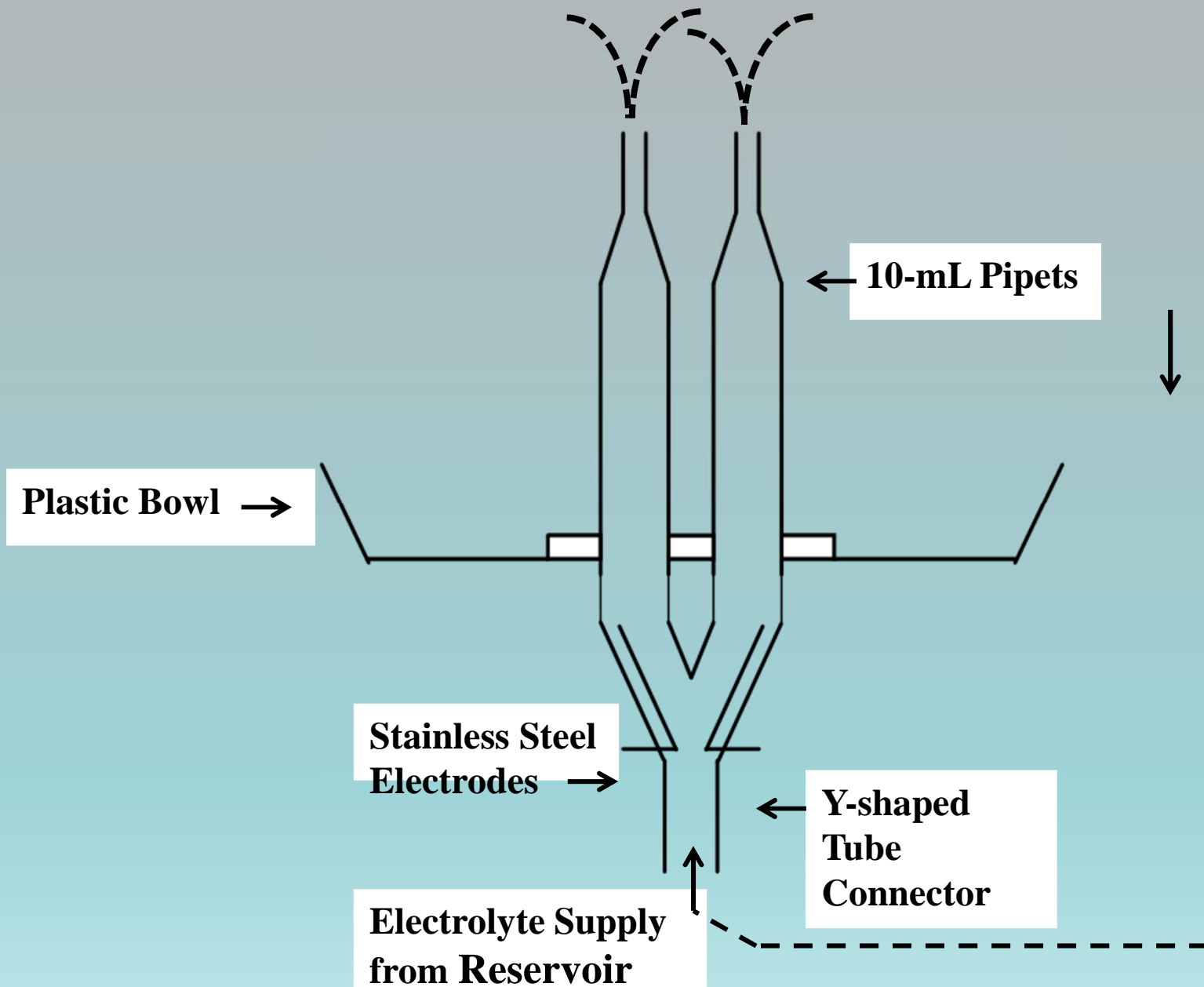
- Prepare the red cabbage juice and other indicator solutions
- Prepare a layer of jelly
- Apply your creative design ideas!



Demonstration 2: Material

- Y-shaped Tube
- Plain Salt
- Stainless Steel Electrodes
- Red Cabbage
- Acid Base Indicators
- 9-V Battery
- Potassium Iodide
- Soluble Starch

Fountain Assembly

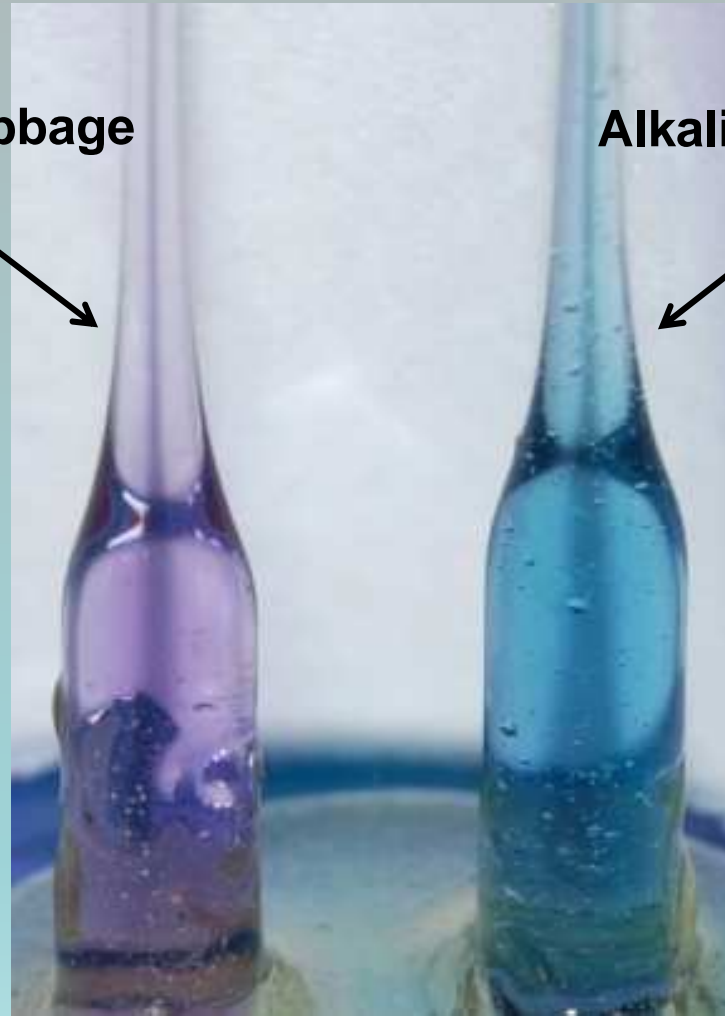


Setup

- Prepare 1 L electrolyte solution
- Feed the electrolyte to a Y-shaped cell
- Power the cell with a 9 V battery
- Enjoy the fountain!

Red Cabbage Juice Fountain

Acidic form of red cabbage



Alkaline form of red cabbage

