

**Unit**  
11

**Lesson**  
8

**AIM**

- What are electrolytic cells?

**AGENDA**

- Electrolytic cells notes
- U11L8 video

**YOYO**

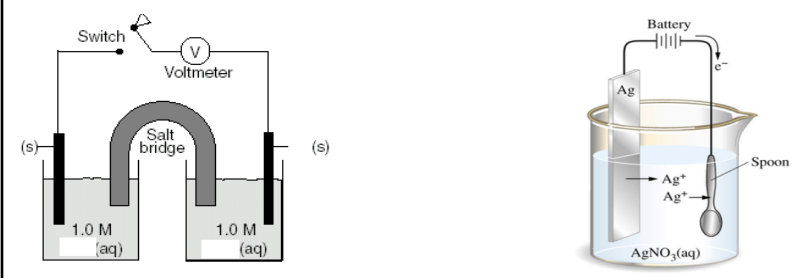
- Pull up the U11L8 (unit 11 lesson 8) video on YouTube

**HOMEWORK**

- Nothing tonight
- Follow the calendar

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## Compare and Contrast



The diagram on the left shows a galvanic cell with two half-cells connected by a salt bridge. Each half-cell contains a silver electrode (s) in a 1.0 M silver ion solution (aq). The electrodes are connected by a wire with a switch and a voltmeter (V). The diagram on the right shows an electrolytic cell with a silver electrode (Ag) and a spoon (cathode) in a silver nitrate solution (AgNO<sub>3</sub>(aq)). A battery is connected to the electrodes, with electrons (e<sup>-</sup>) flowing from the battery to the spoon.

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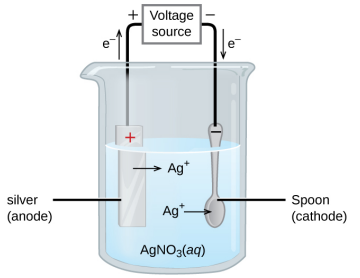
## Electrolytic Cells

- Reaction cannot occur spontaneously, so electricity is used to force the reaction to occur. In other words, **electrical energy** is converted to **chemical energy**. (opposite of voltaic cell)
- When electricity is used to force a chemical reaction to occur, the process is called **electrolysis**.

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## Electrolytic Cell Cathode

- Electrode where **electrons** are **sent**
- The **negative** electrode (opposite of voltaic cell)
- Electrode where **reduction** occurs (red cat)

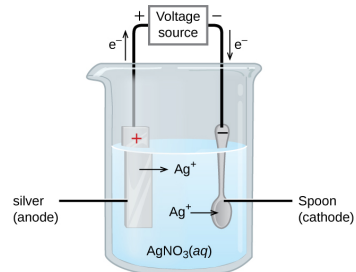


The diagram shows a beaker containing a silver nitrate solution (AgNO<sub>3</sub>(aq)). A silver electrode (anode) is connected to the positive terminal of a voltage source. A spoon (cathode) is connected to the negative terminal. Electrons (e<sup>-</sup>) flow from the voltage source to the spoon. Silver ions (Ag<sup>+</sup>) are shown moving towards the spoon.

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## Electrolytic Cell Anode

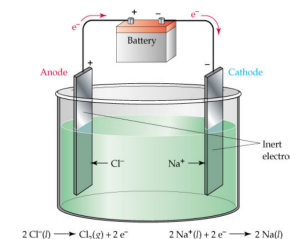
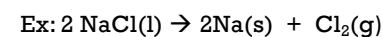
- Electrode where **electrons** are **drawn away from**
- The **positive** electrode (opposite of voltaic cell)
- Electrode where (**oxidation** occurs an ox)



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## Electrolytic Cells: Uses

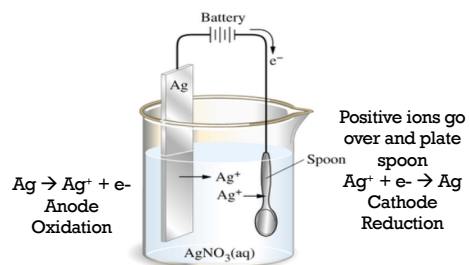
1. To obtain pure elements such as sodium and chlorine by the electrolysis of molten salts.



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## Electrolytic Cells: Uses

2. To electroplate metals onto a surface. The material to be plated with a metal is the **cathode**. The **anode** is made of the metal used for the plating.



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## Compare and Contrast

	Galvanic/Voltaic Cell	Electrolytic Cell
Flow of e- (Spontaneous or Forced)	Spontaneous	Forced
(+) Electrode	Cathode	Anode
(-) Electrode	Anode	Cathode
Direction of e- Flow	Anode to cathode	Anode to cathode
Reduction Half Cell	Cathode	Cathode
Oxidation Half Cell	Anode	Anode

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