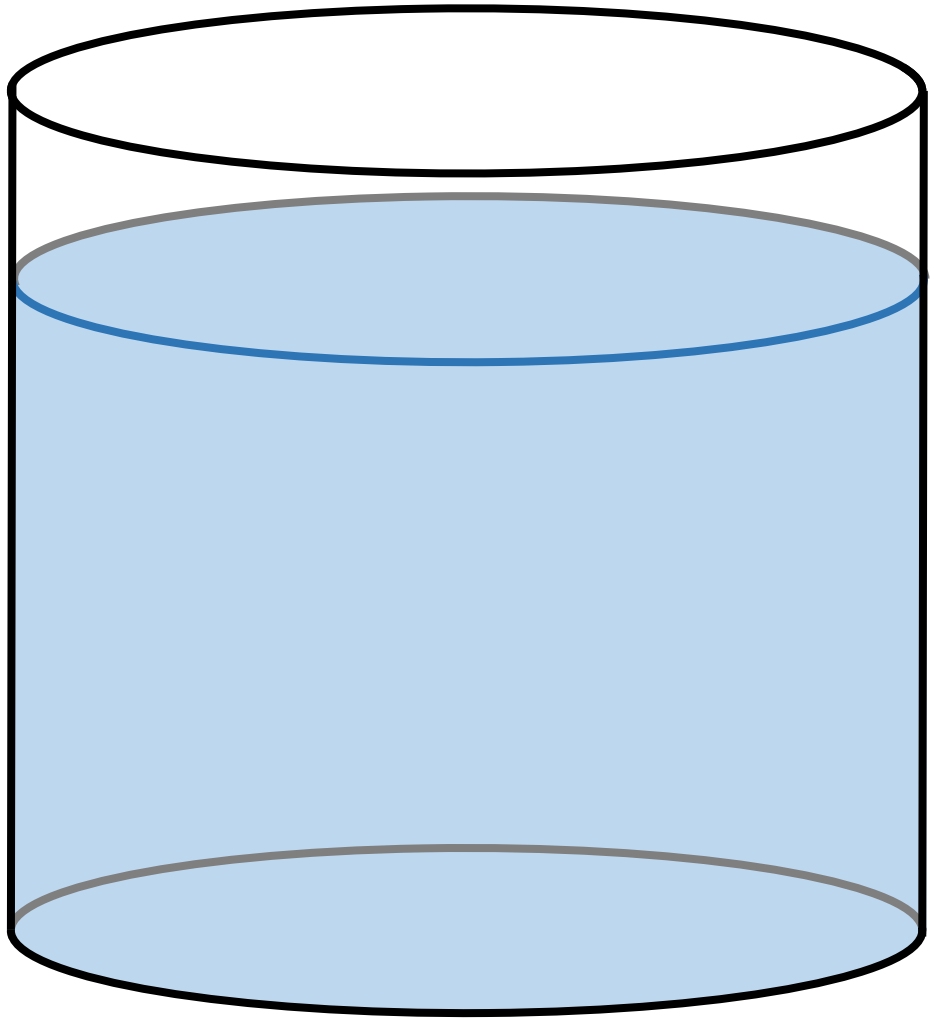
Electrolytic Dissociation

+ -

When certain molecules are **dissolved** in water, they split up into **ions**.



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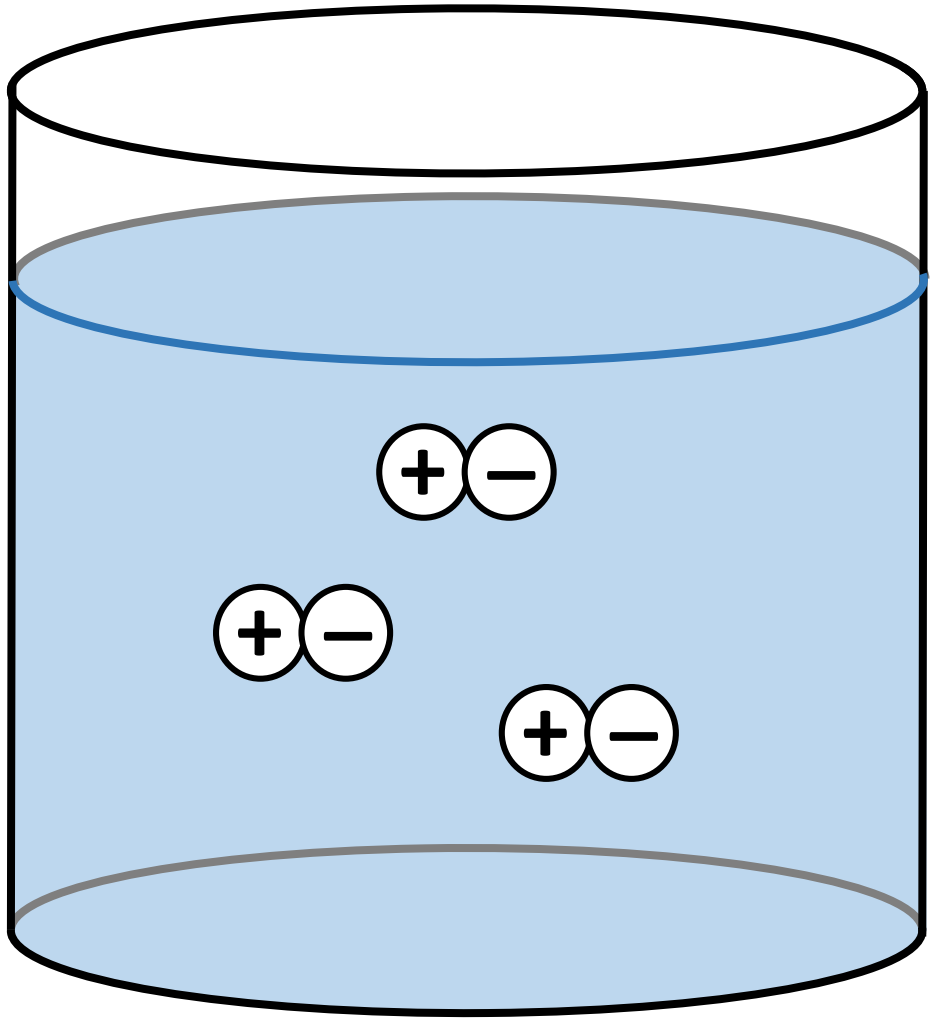

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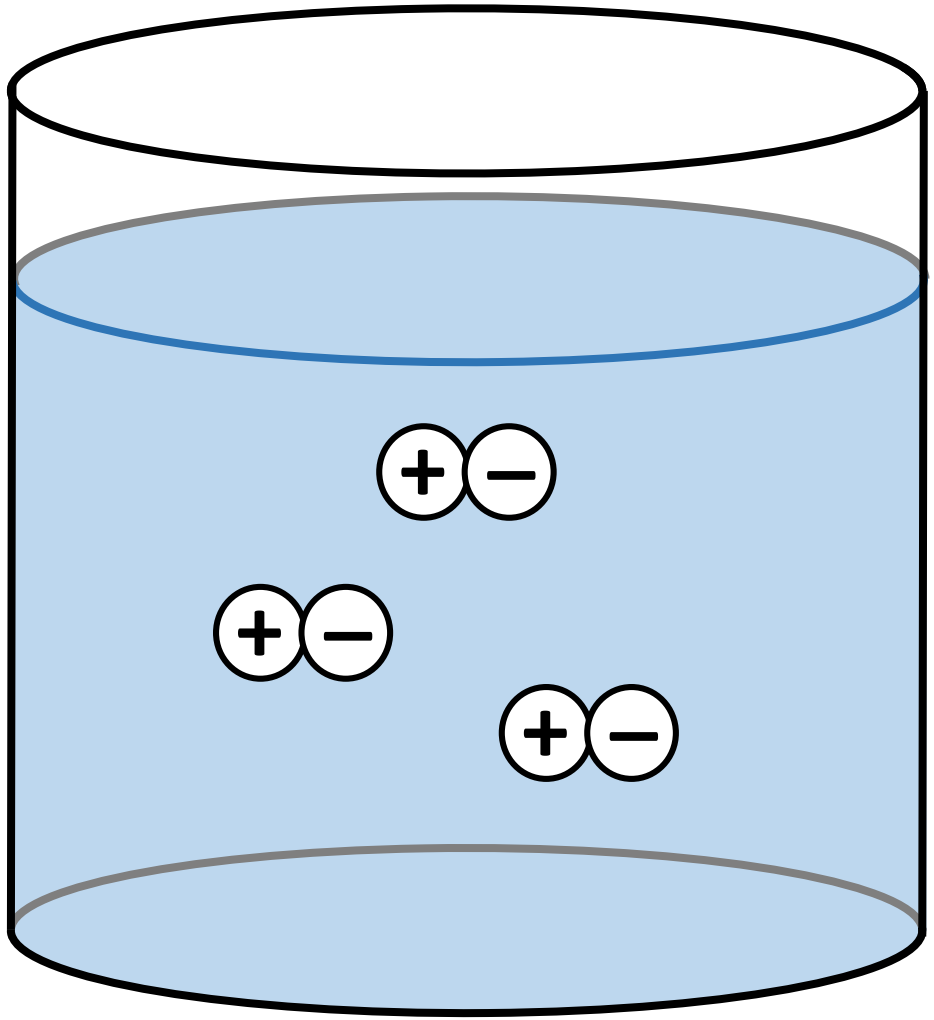
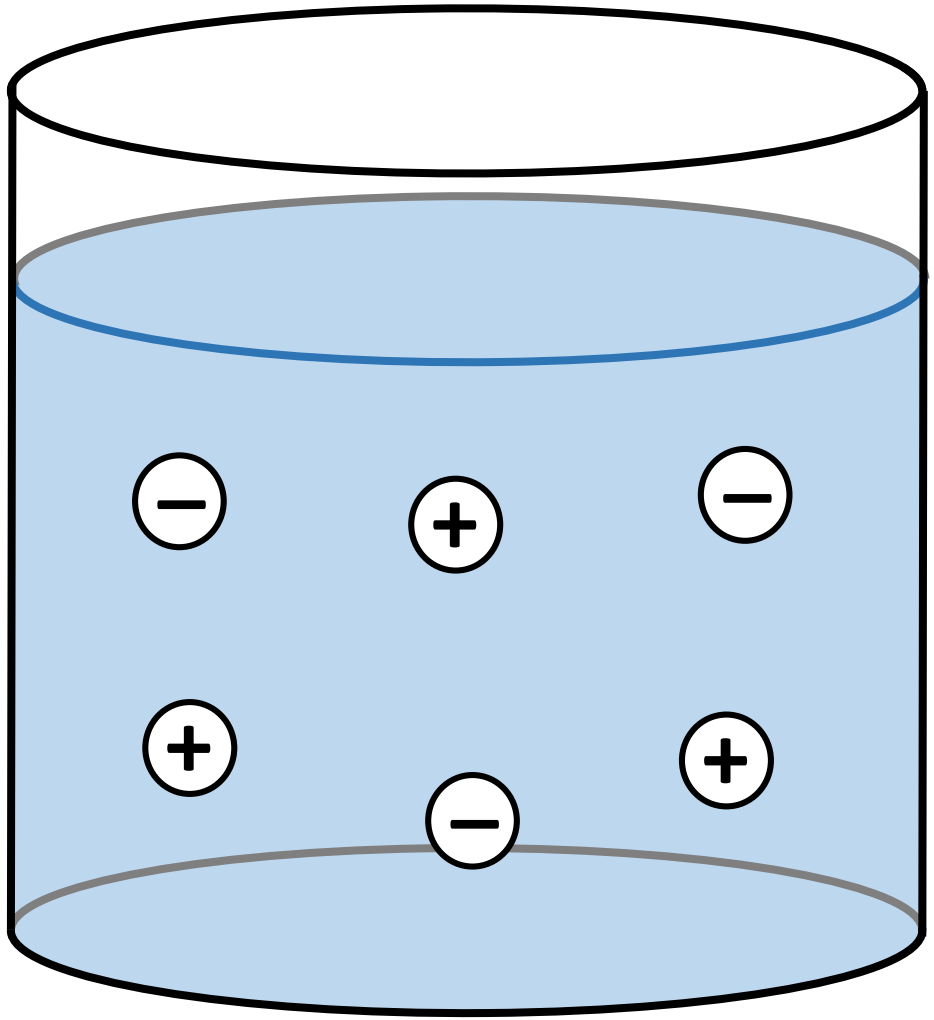
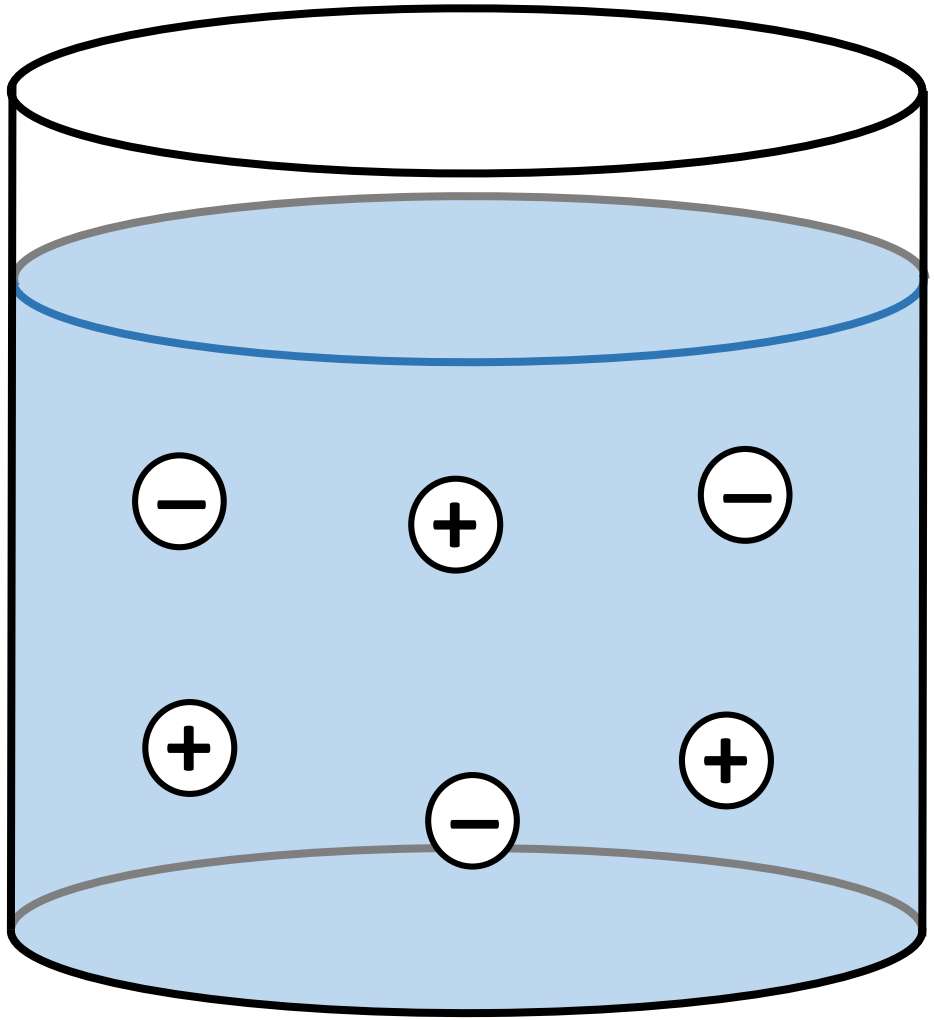


When certain molecules are **dissolved** in water, they split up into **ions**.

This is called **dissociation**.



The ions can move around in the water, and they carry an electric charge.



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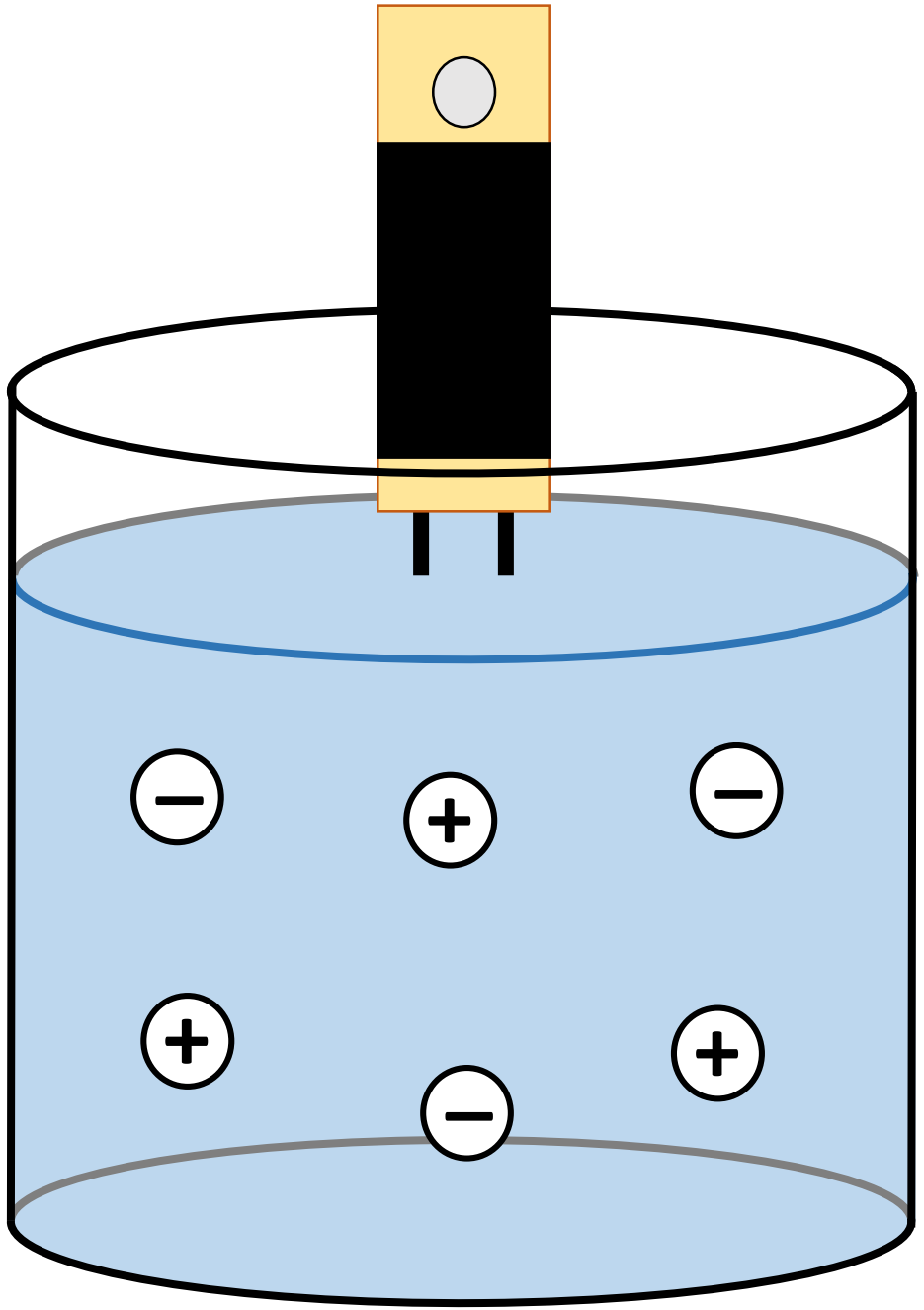
Because of this the resulting solution can now conduct electricity.



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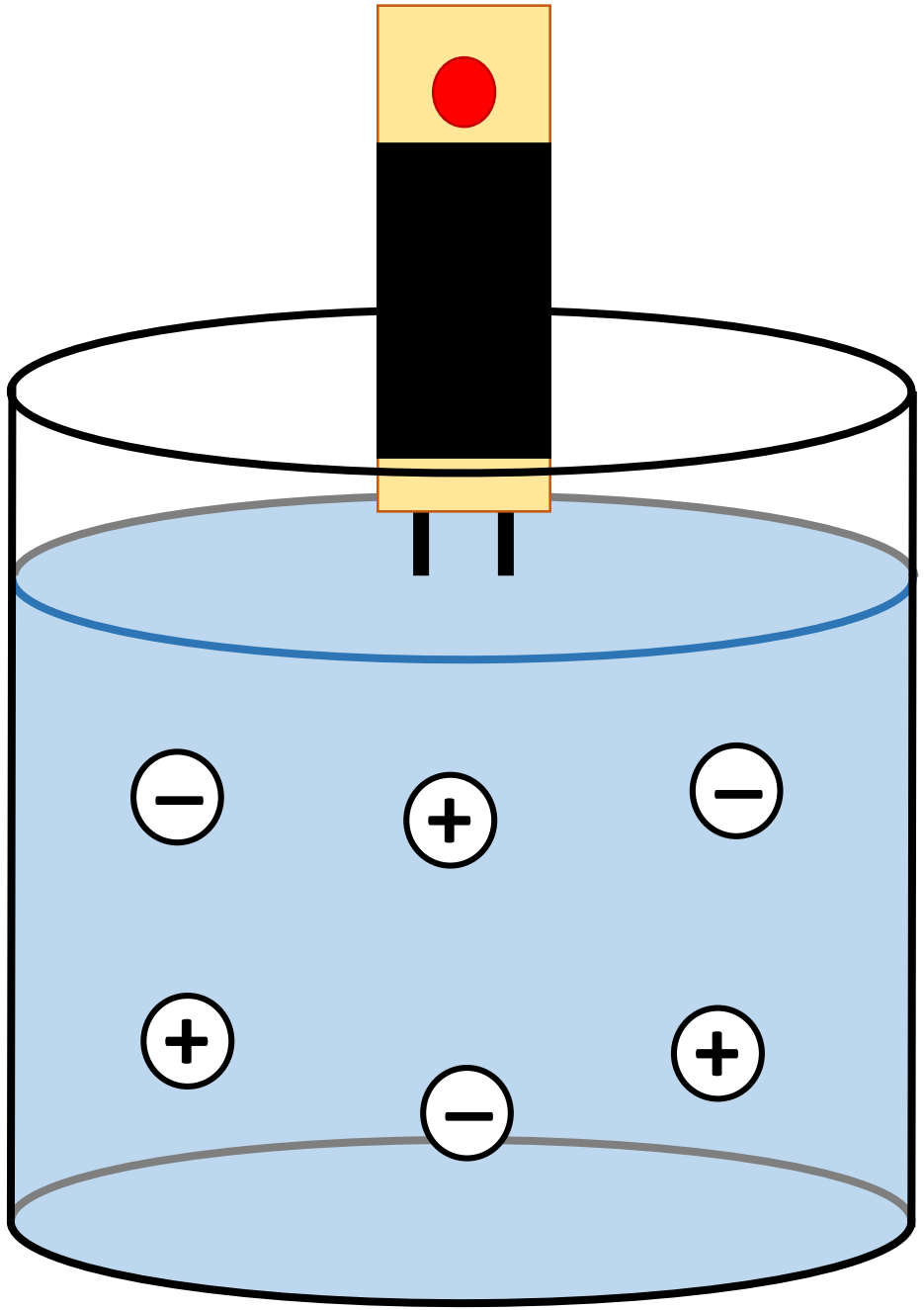
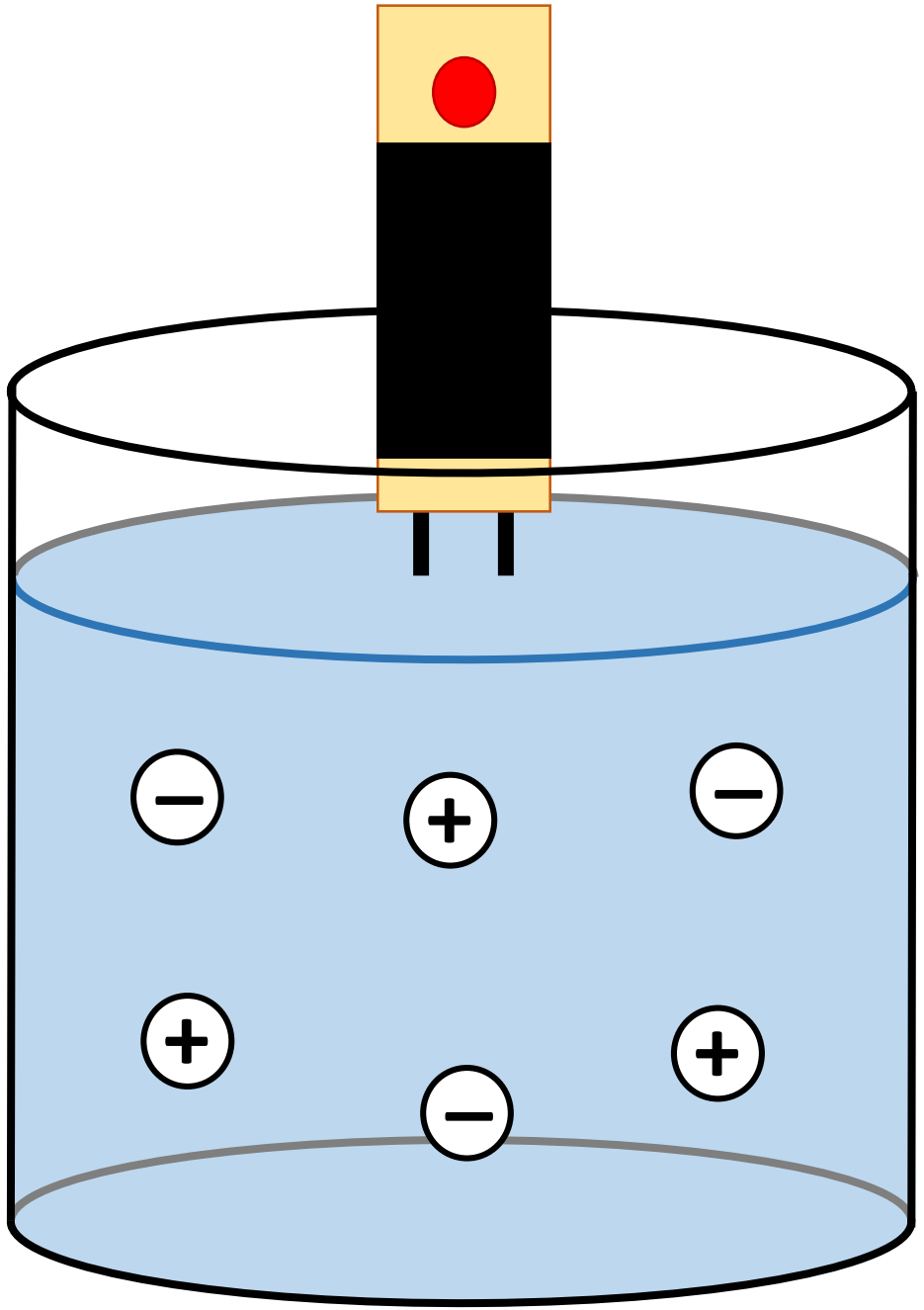
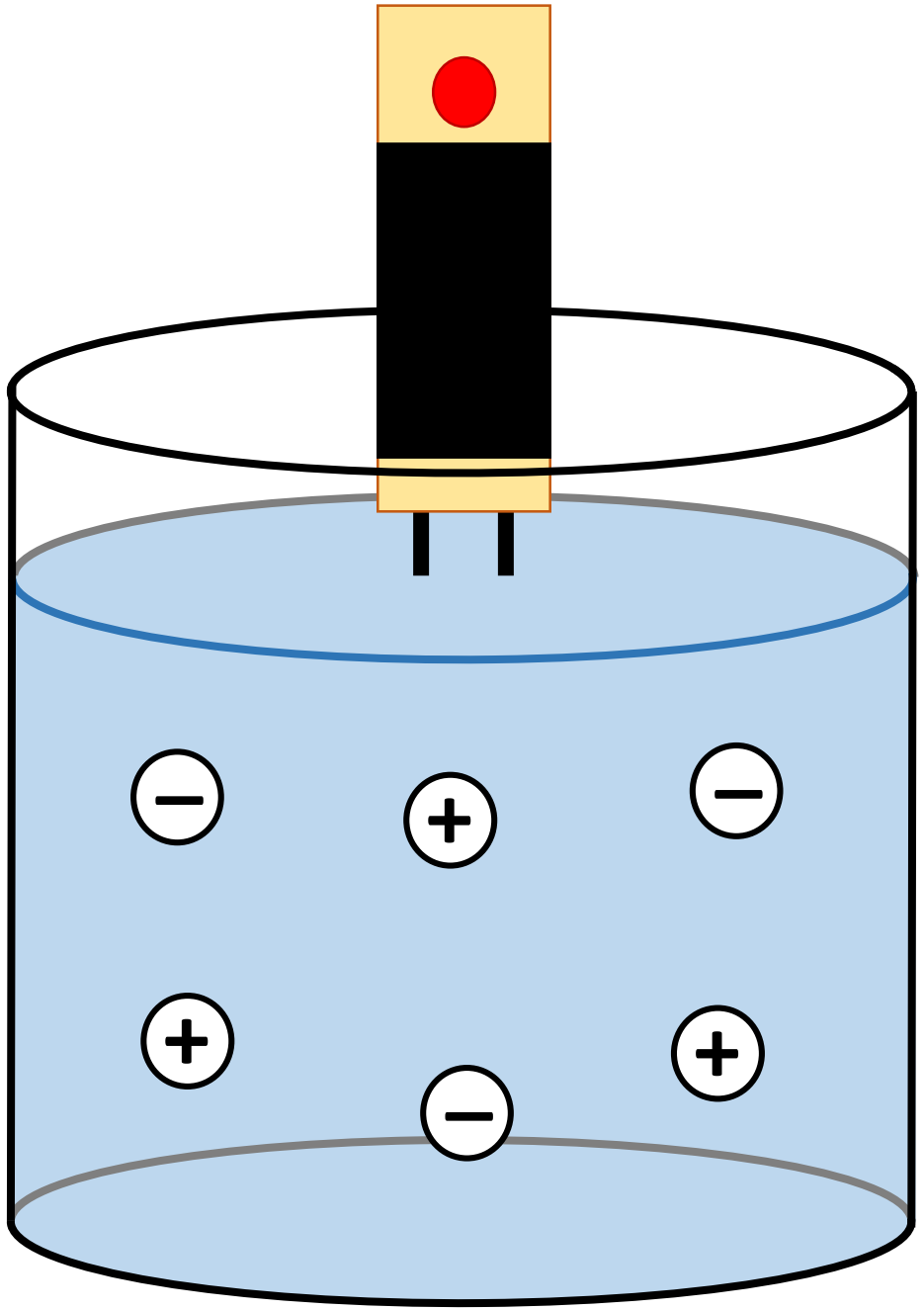


A substance that dissociates into **ions** when dissolved in water is called an **electrolyte.**

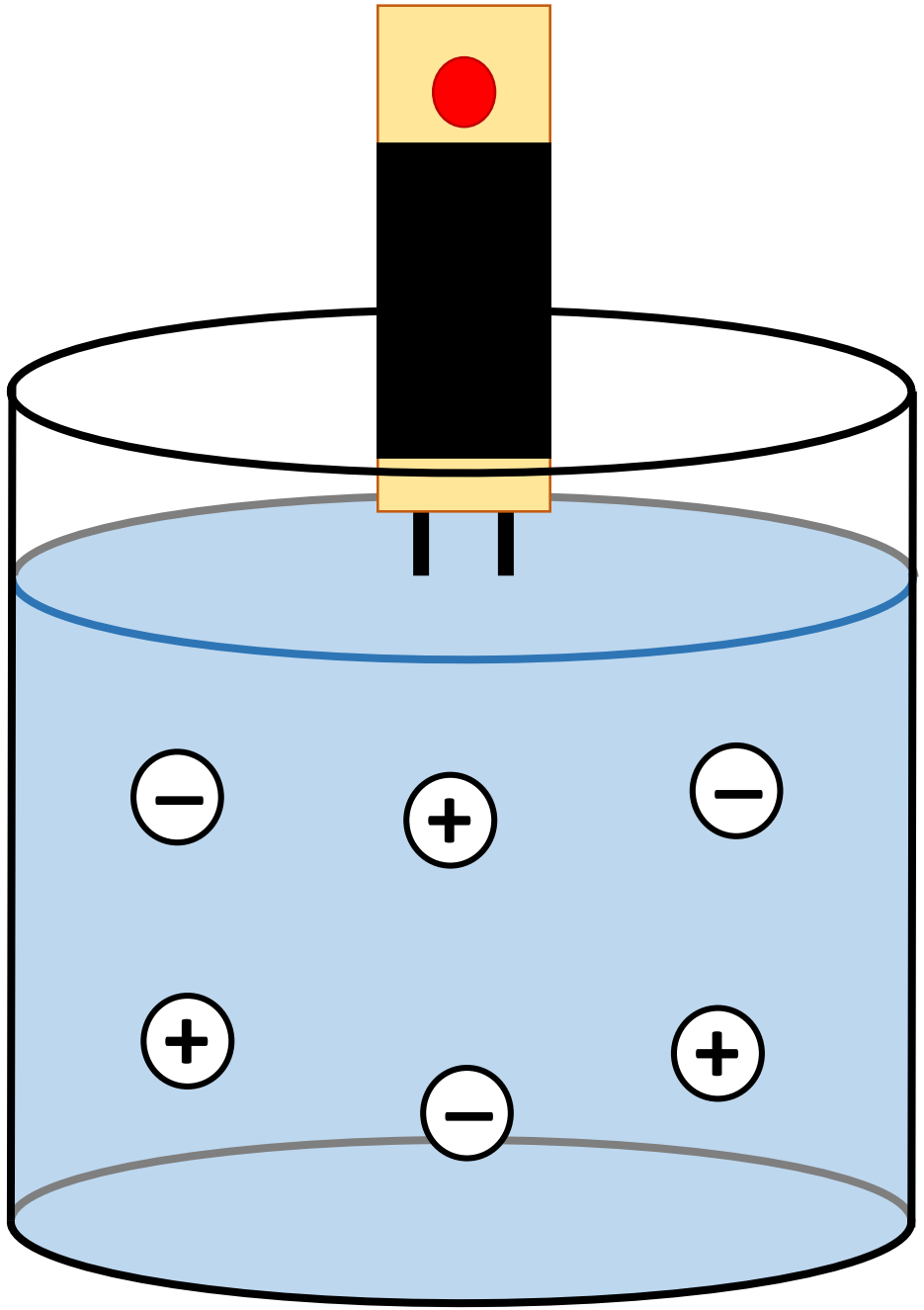


A solution that conducts electricity due to the presence of ions is called an **electrolytic solution.**



There are three types of electrolytic solutions.

- Acids
- Bases
- Salts

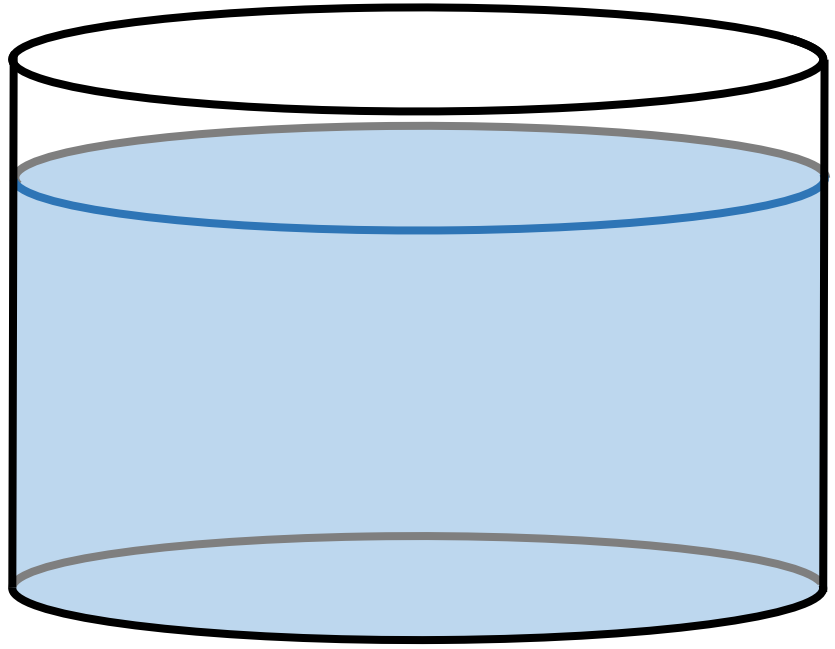


Acids

An acid is a substance that releases hydrogen ions, H^+, in solution.

Example: Hydrogen chloride

$$HCl \rightarrow$$



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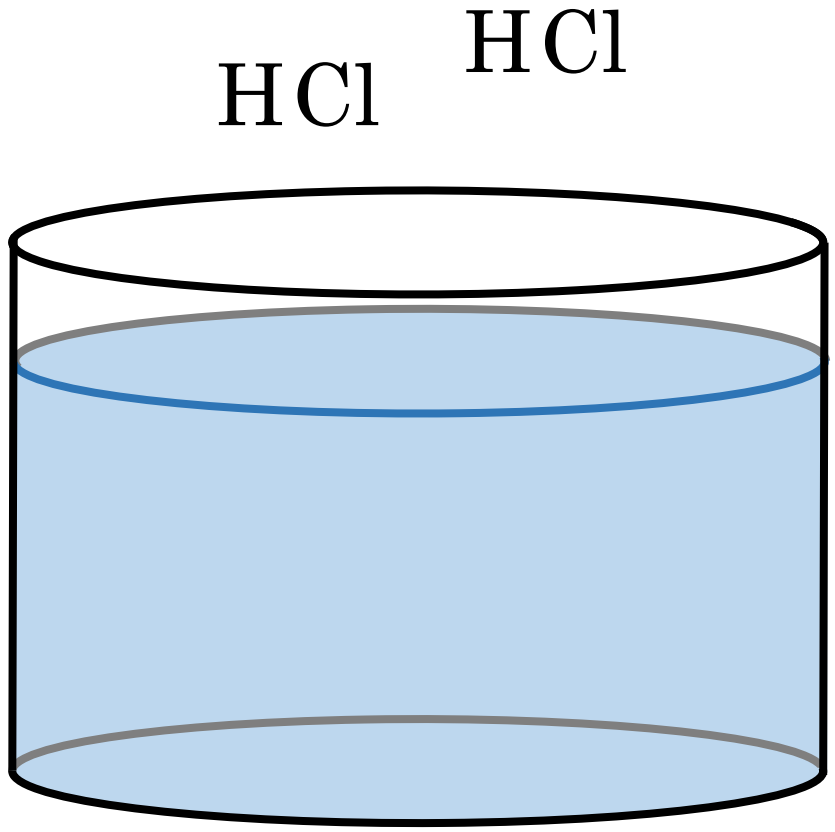


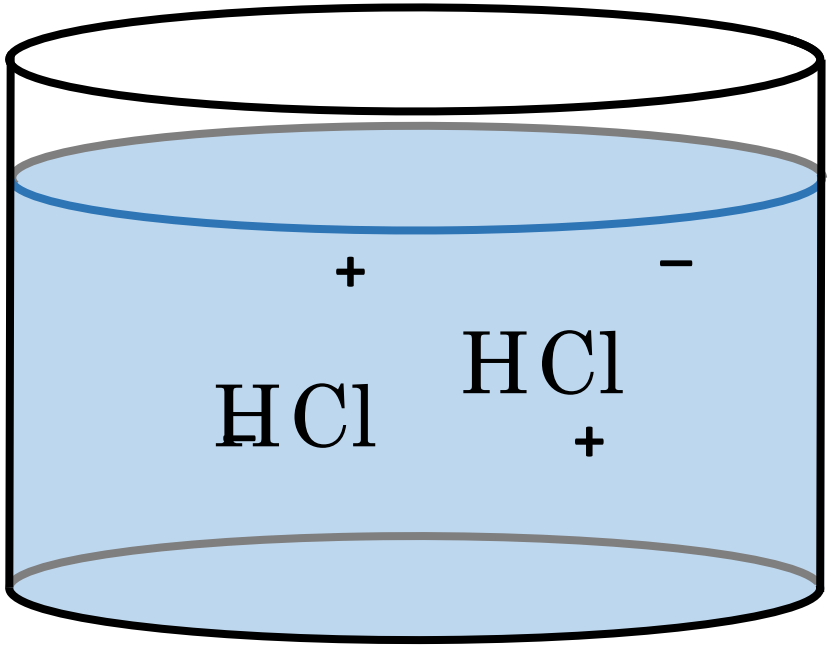
Acids

An acid is a substance that releases hydrogen ions, H^+, in solution.

Example: Hydrogen chloride

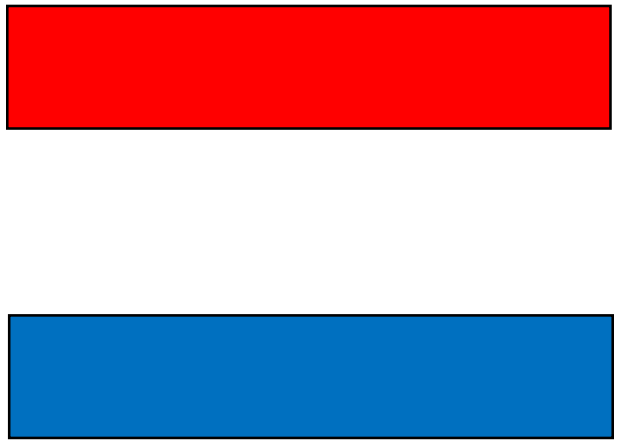
$$HCl \rightarrow H^+ + Cl^-$$

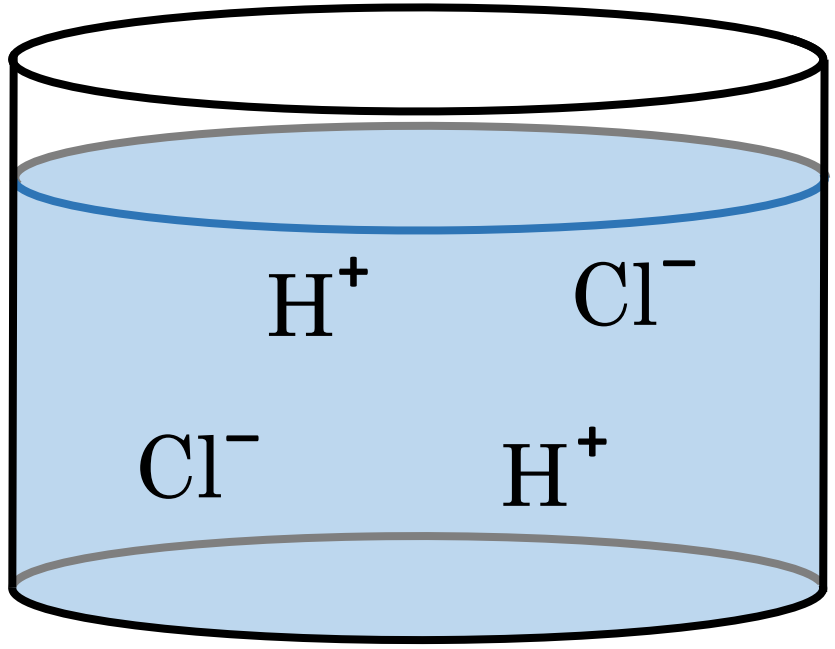
Acids are **electrolytic**; they will conduct electricity when dissolved in water.



Acids

Reaction with litmus paper:





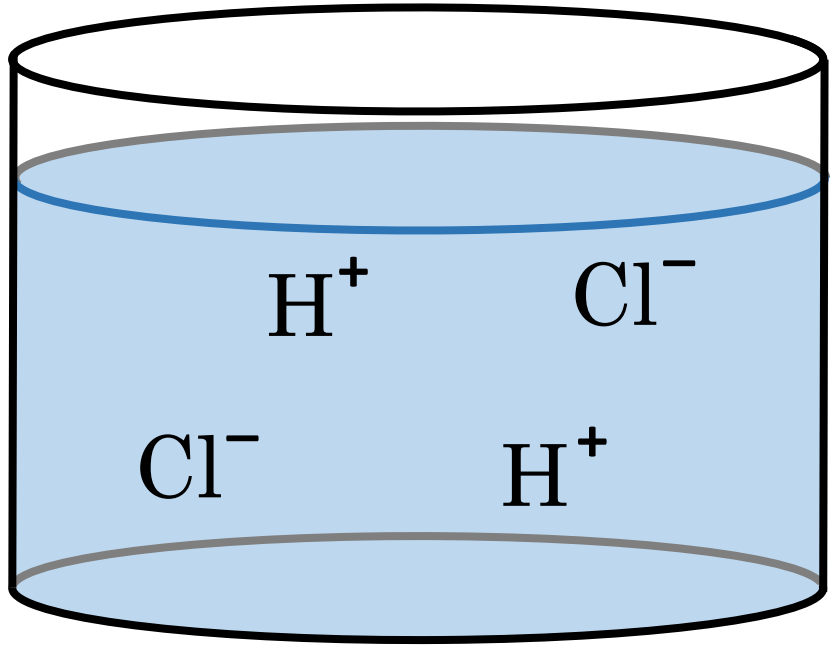
Acids

Reaction with litmus paper:

- Red litmus stays red

- Blue litmus turns red

pH of an acid is less than 7



Acids

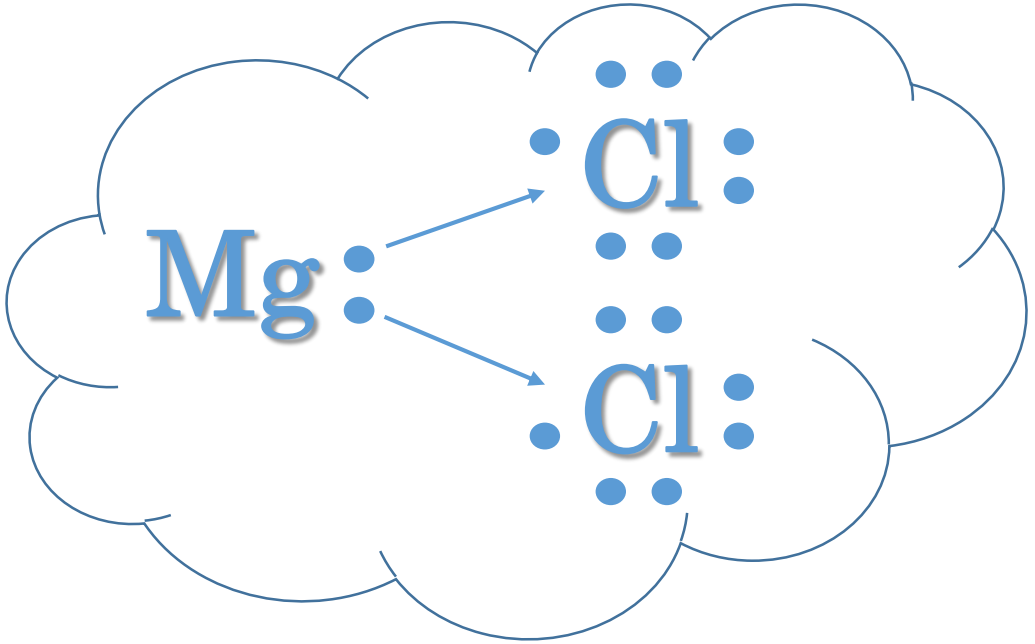
Acids taste **sour** *(if it doesn't kill you)*

Acids

Acids can be neutralized by a base

Acids react with metals; the reaction releases hydrogen gas, H_2

Example: $HCl + Mg \rightarrow H_2 + MgCl_2$



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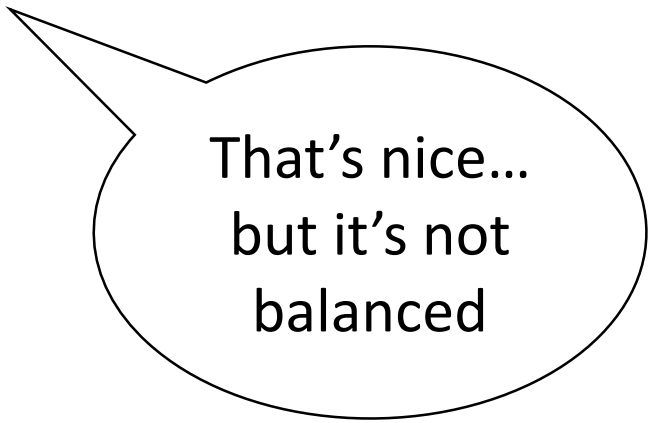
Example: $2\,HCl + Mg \rightarrow H_2 + MgCl_2$



Acids

Molecular formulas

The molecular formula of an acid will appear in one of the following two ways:

Start with H...

HCl

HF

HNO_3

H_2SO_4

End with ...$COOH$

CH_3COOH

$C_5H_7O_5COOH$

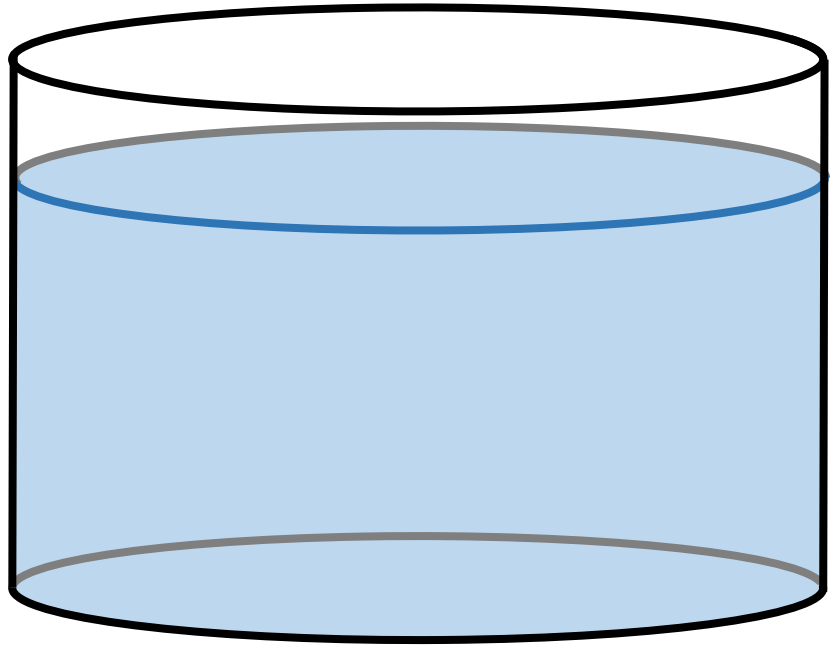
Starts with H, but not an acid: H_2O

Bases

A base is a substance that releases hydroxide ions, OH^-, in solution.

Example: Sodium hydroxide

$NaOH \rightarrow$



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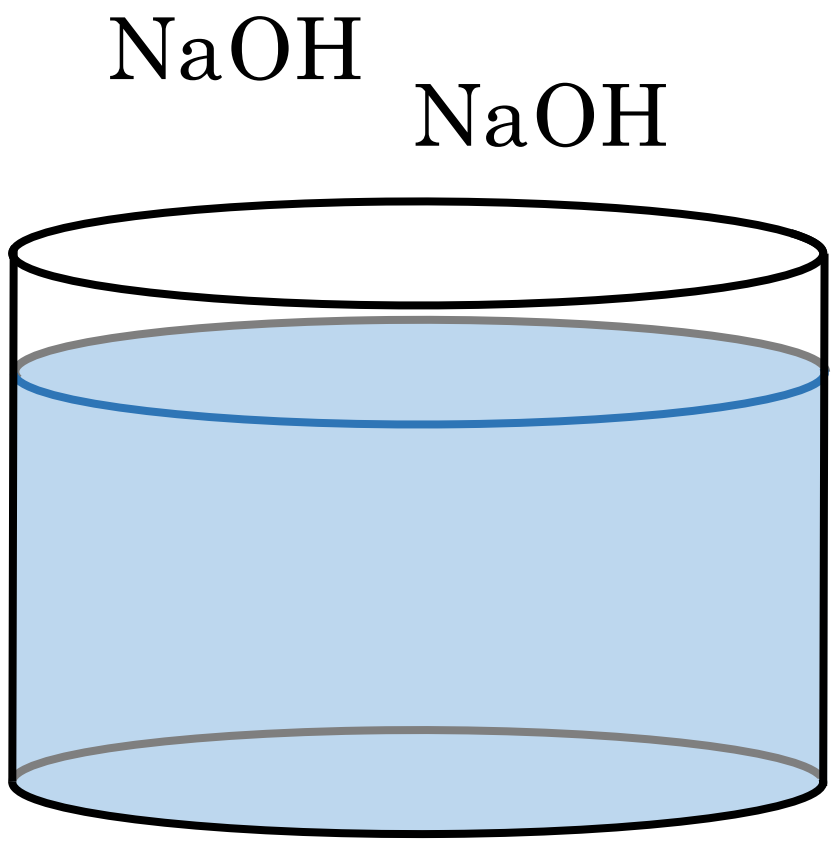


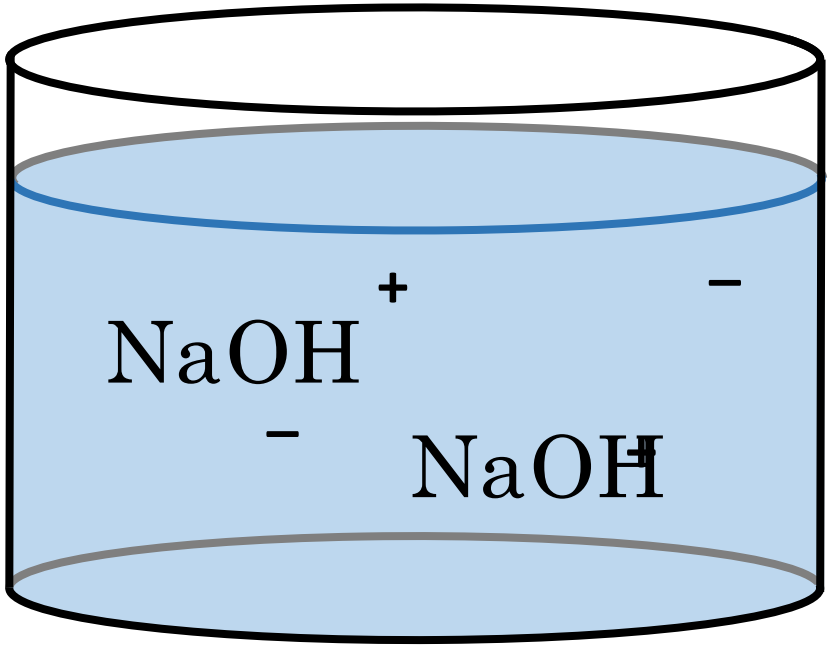
Bases

An base is a substance that releases hydroxide ions, OH^-, in solution.

Example: Sodium hydroxide

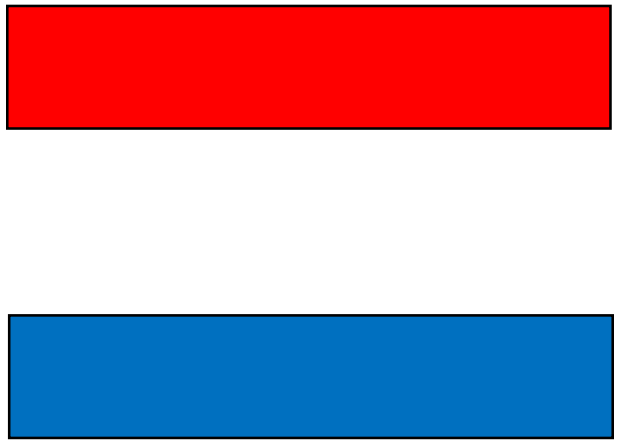
$$NaOH \rightarrow Na^+ + OH^-$$

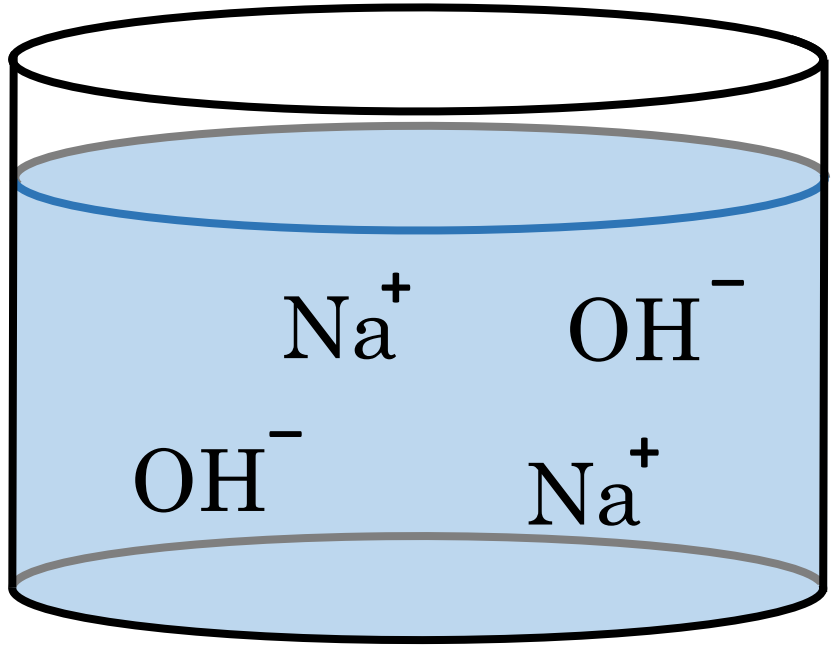
Bases are **electrolytic**; they will conduct electricity when dissolved in water.



Bases

Reaction with litmus paper:





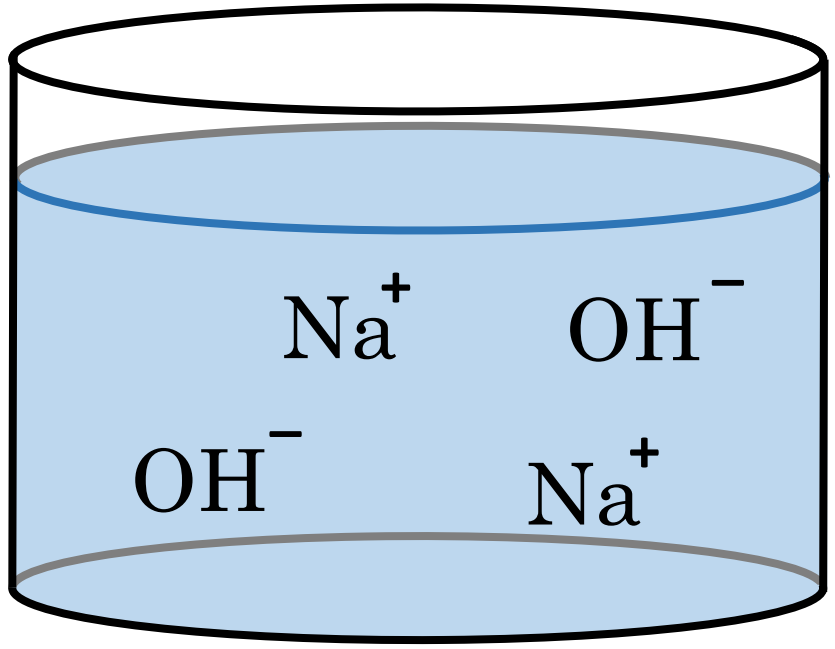
Bases

Reaction with litmus paper:

- Red litmus turns blue

- Blue litmus stays blue

pH of a base is greater than 7



Bases

Bases taste bitter

Bases

Bases feel

Bases

Bases feel soapy / slippery

Bases

Bases feel soapy / slippery

Bases can be neutralized by an acid

Bases

Bases are also known as **alkaline** solutions

The molecular formula of a base:

Metal + OH

$NaOH$

KOH

$Ca(OH)_2$

$Mg(OH)_2$

Exception *(doesn't start with a metal):*

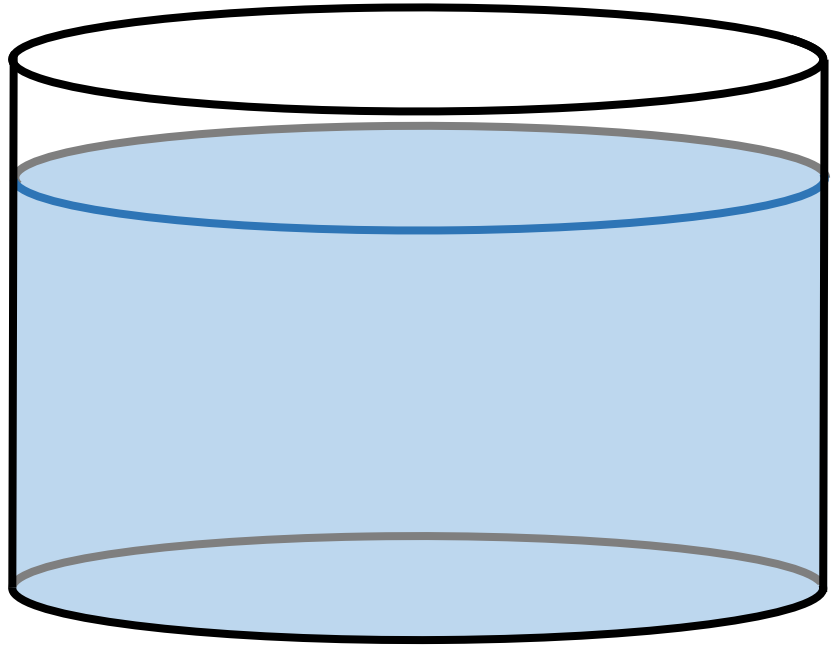
NH_4OH

Salts

A salt is a substance that that is made up of metallic and non-metallic ions.

Example: Sodium chloride

$$NaCl \rightarrow$$



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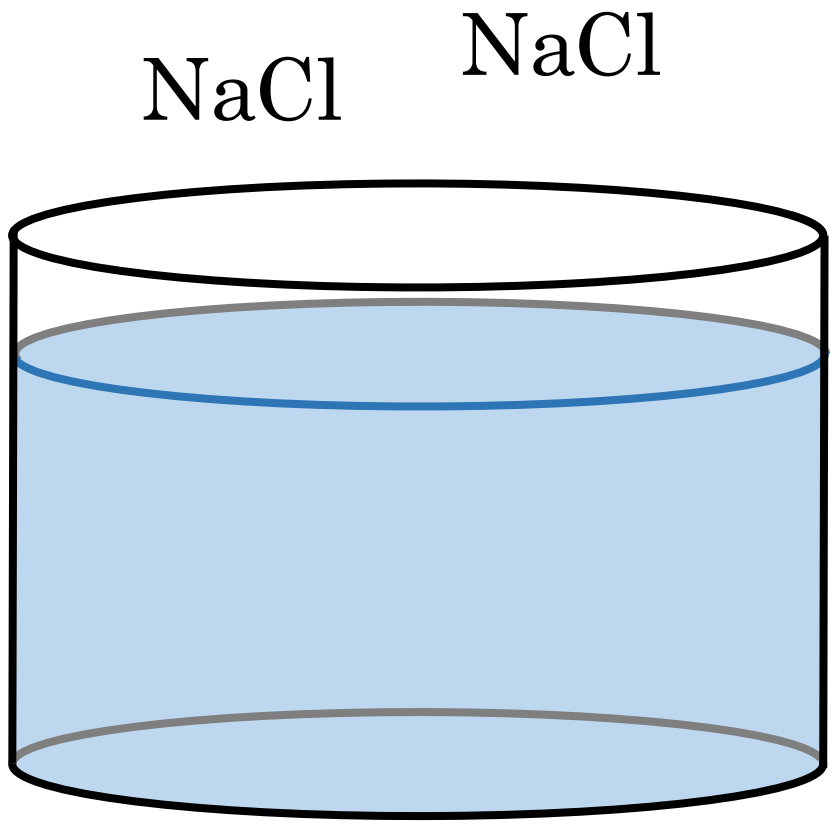

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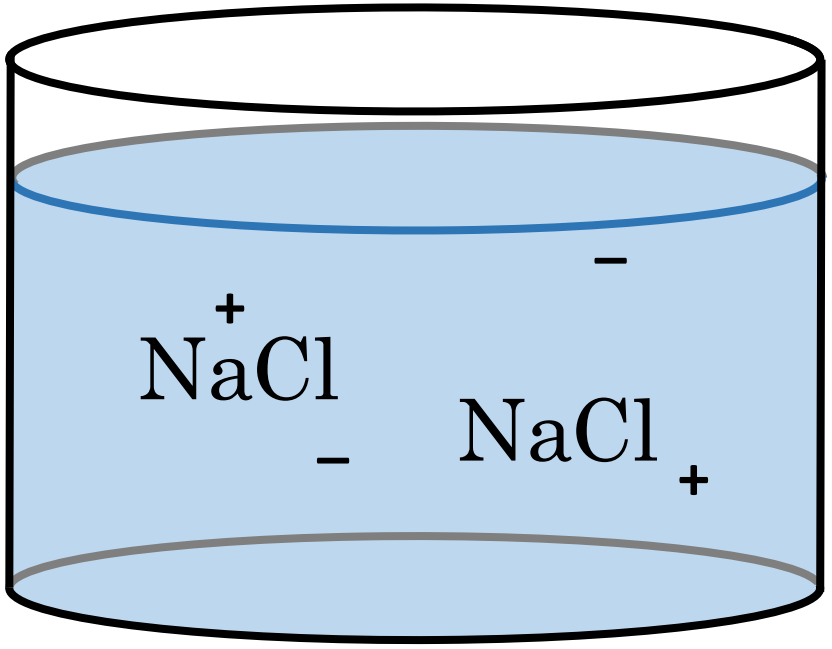


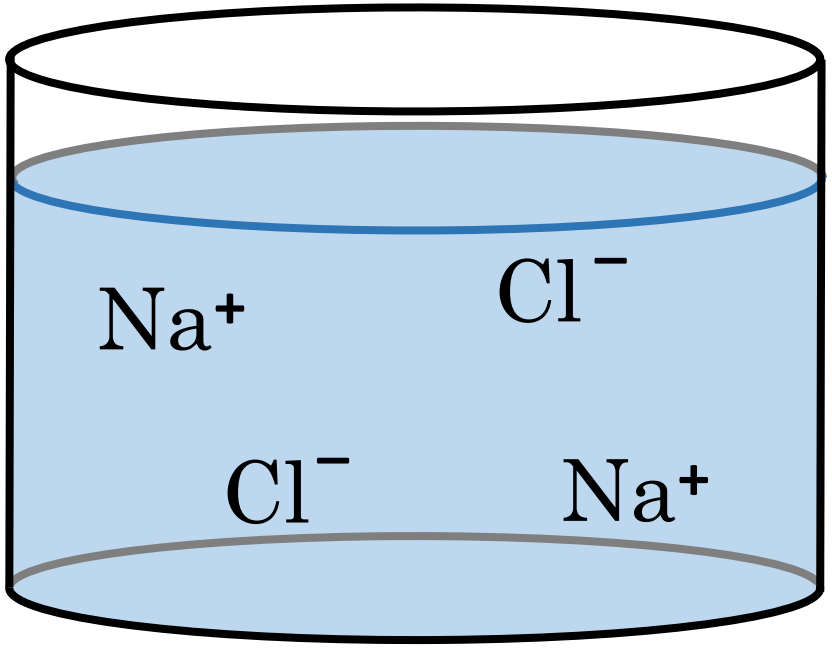
Salts

A salt is a substance that that is made up of metallic and non-metallic ions.

Example: Sodium chloride

$$NaCl \rightarrow Na^{+} + Cl^{-}$$

Salts are **electrolytic**;
they will conduct electricity
when dissolved in water.



Salts

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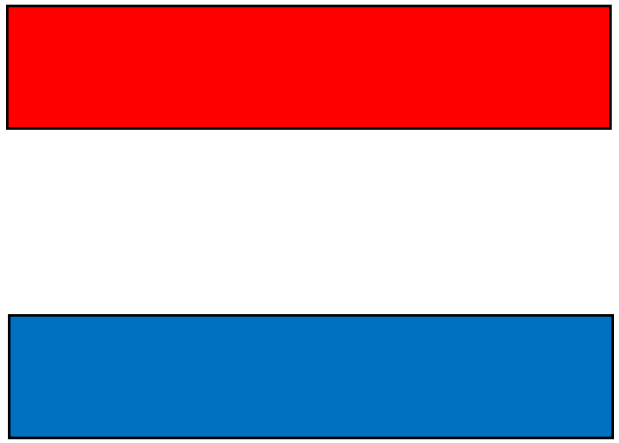
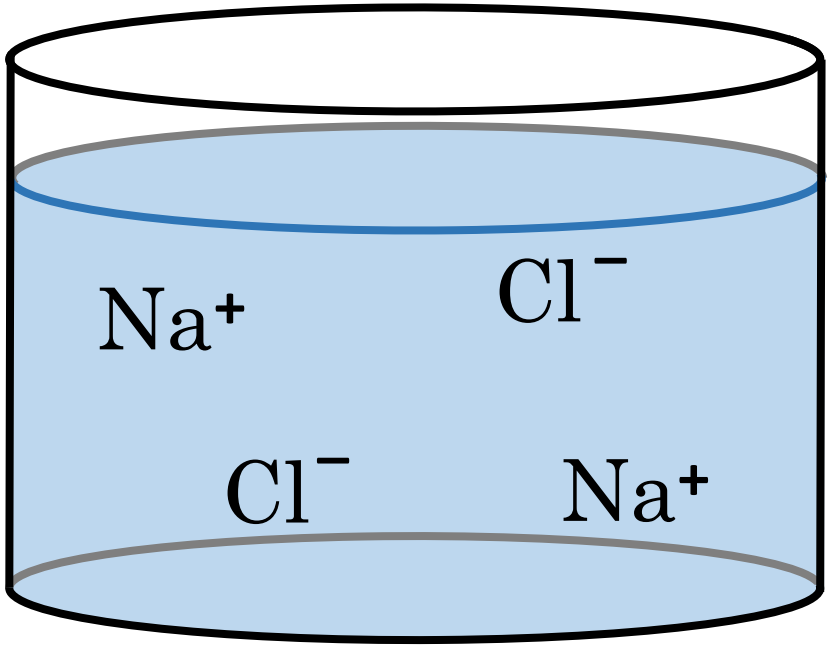




Salts

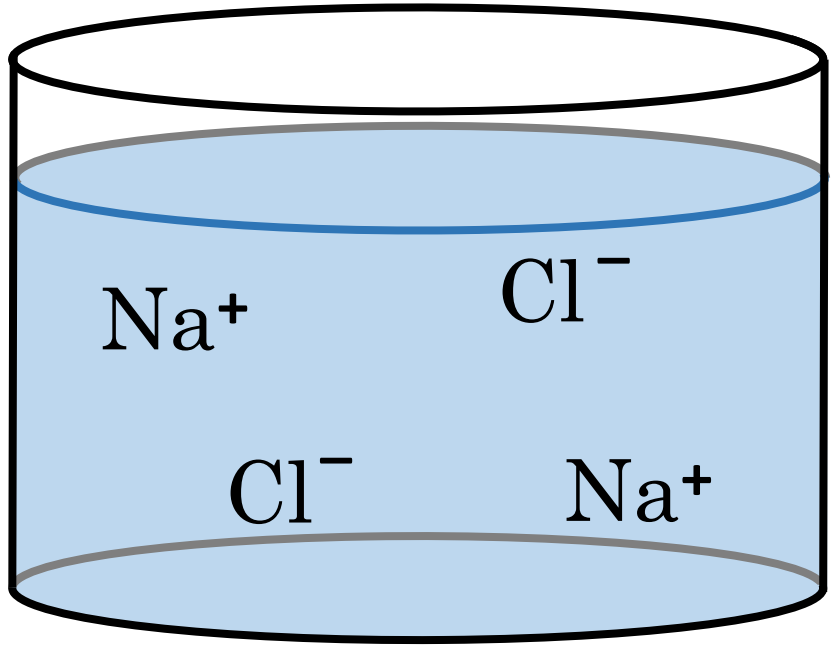
Reaction with litmus paper:

- Red litmus stays red

- Blue litmus stays blue

pH of a salt is 7 (neutral)

(note: there are exceptions)



Salts

Salts (and water) are formed when acids react with bases.

(neutralization reaction)

Salts

The molecular formula of a salt:

$$\text{Metal} + \text{Non-metal(s)}$$

NaF

$CaCl_2$

KNO_3

$Al_2(SO_4)_3$

Exception *(doesn't start with a metal):*

Can also start with NH_4 …

Basic Humor