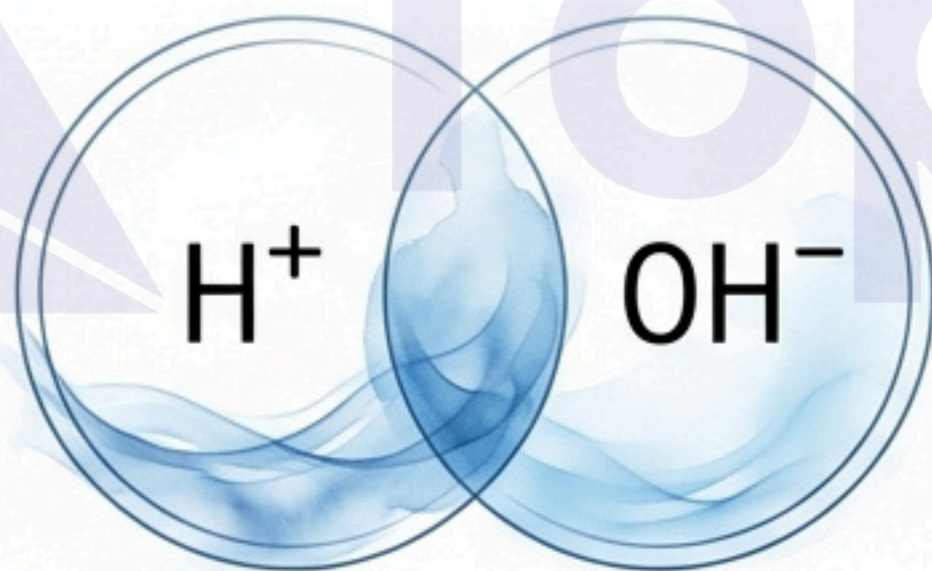


IONIC EQUILIBRIUM MODULE

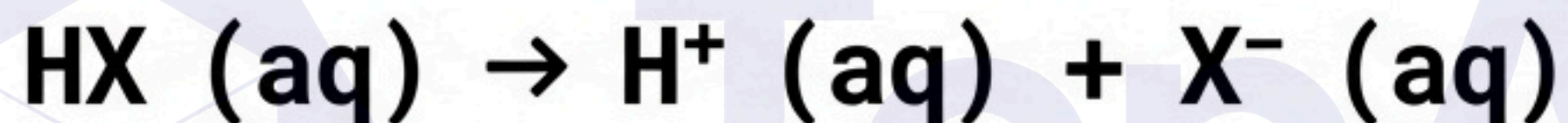
Arrhenius Concept of Acids and Bases



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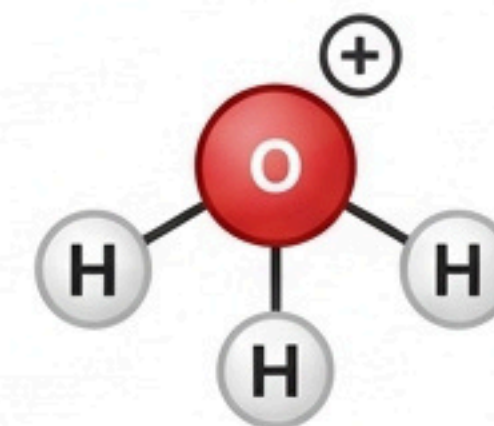
The Proton Donor in Water

An **Arrhenius acid** is a substance that dissociates in water to produce hydrogen ions.



The Chemical Reality

A bare proton (H^+) is intensely reactive and cannot exist freely. It immediately bonds to a solvent water molecule.



Hydronium



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$$E=mc^2$$



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Key Highlights

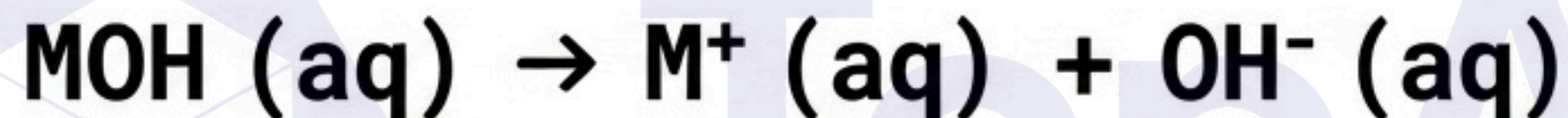
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The Hydroxyl Producer

Requires
Aqueous
Medium

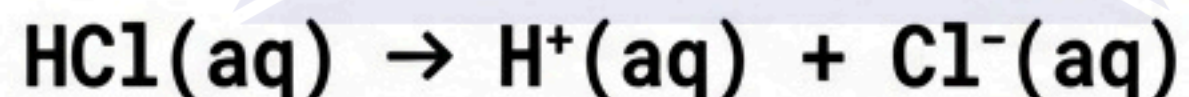
An **Arrhenius base** is a substance that ionizes in an aqueous solution to produce hydroxyl ions.



OH⁻
(Hydroxyl Ion)

Complete vs. Partial Dissociation

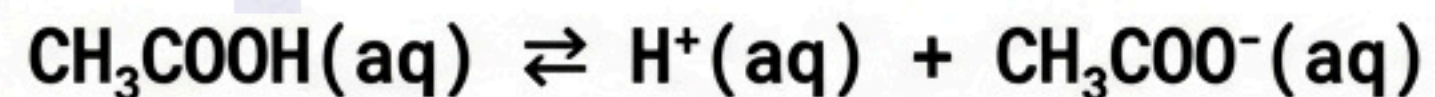
Strong Electrolytes
(~100% Dissociated)



Examples

e.g., HClO_4 , HCl , NaOH , KOH

Weak Electrolytes
(< 5% Dissociated)



Equilibrium established between ions
and unionized molecules.

Examples

e.g., Acetic Acid, NH_4OH

The Aqueous Limitation

Exam
Smart

The Aqueous Mandate

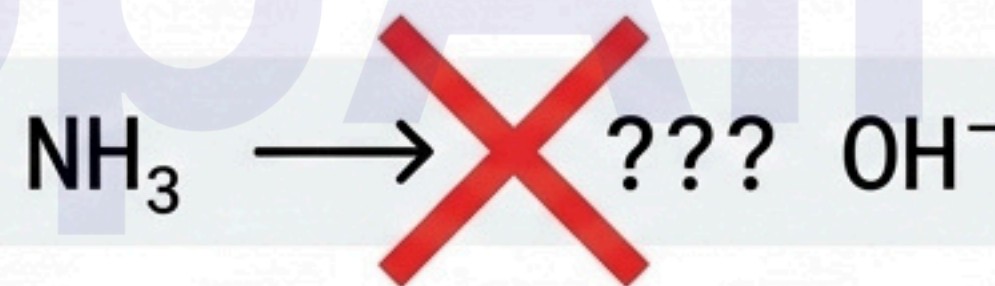


The Arrhenius definitions are strictly limited to aqueous solutions.

No water = no Arrhenius acid or base.

The Ammonia Problem

Arrhenius cannot explain the basicity of substances that lack a hydroxyl group.



Svante Arrhenius (1859–1927)

His foundational theory paved the way for the broader Brønsted-Lowry concept.



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