
ACETIC ACID – KEY POINTS (STUDENT CONTENT)

1. BASIC INFORMATION

- Name: **Acetic acid**
 - Found in: **Vinegar**
 - Type: **Organic acid**
 - Strength: **Weak acid**
-

2. FORMULAS

- Molecular formula: **CH₃COOH**
 - Another way: **C₂H₄O₂**
 - Structural formula: **CH₃-COOH**
-

3. FUNCTIONAL GROUP

- Functional group: **-COOH**
 - Name: **Carboxyl group**
 - This group makes the compound **acidic**
-

4. STRUCTURAL CHARACTERISTICS

- Contains:
 - Carbon (C)
 - Hydrogen (H)
 - Oxygen (O)
- Has:
 - Single bonds (C-C, C-H)

- Double bond (C=O)
 - Hydroxyl group (-OH)
-

5. PHYSICAL PROPERTIES

- State: **Liquid**
 - Color: **Colorless**
 - Smell: **Strong, sour (vinegar smell)**
 - Taste: **Sour**
 - Solubility: **Completely soluble in water**
 - Density: **~1.05 g/cm³**
 - Boiling point: **~118°C**
-

6. GENERAL ACID PROPERTIES

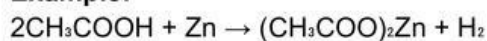
- Turns **blue litmus** → **red**
 - Produces **hydrogen ions (H⁺)** in solution
 - Reacts with:
 - Metals
 - Bases
 - Carbonates
-

7. REACTION WITH METALS

General form:

Acid + Metal → Salt + Hydrogen gas (H₂)

Example:



Key point:

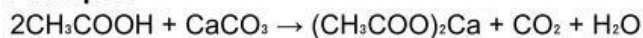
- Produces **hydrogen gas**
-

8. REACTION WITH LIMESTONE (CaCO₃)

General form:

Acid + Carbonate \rightarrow Salt + CO₂ + H₂O

Example:



Key points:

- Produces **carbon dioxide (CO₂)**
 - Causes **bubbling**
-



9. REACTION WITH BASES (NEUTRALIZATION)

General form:

Acid + Base \rightarrow Salt + Water

Example:



Key point:

- Called **neutralization reaction**
-

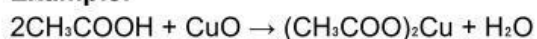


10. REACTION WITH METAL OXIDES

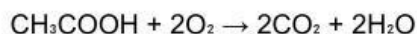
General form:

Acid + Metal oxide \rightarrow Salt + Water

Example:



11. COMBUSTION REACTION



Key point:

- Produces **carbon dioxide and water**

12. ESTERIFICATION (IMPORTANT)

General form:

Acid + Alcohol \rightleftharpoons Ester + Water

Example:

$\text{CH}_3\text{COOH} + \text{C}_2\text{H}_5\text{OH} \rightleftharpoons \text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}$

Key points:

- Produces **ester**
 - Esters have **sweet smell (fruits, perfumes)**
-

13. SUMMARY FACTS

- Acetic acid is a **weak organic acid**
 - Contains **-COOH group**
 - Found in **vinegar**
 - Reacts like a **typical acid**
 - Can form **esters with pleasant smells**
-

HOW TO USE IN LIVWORKSHEETS (SMART IDEAS)

Turn this into:

- Fill in blanks \rightarrow "Acetic acid formula is ____"
 - Matching \rightarrow reaction type \leftrightarrow products
 - Multiple choice \rightarrow gas formed, group name
 - Label diagram \rightarrow COOH group
 - Short answer \rightarrow "Why does it bubble with limestone?"
-