



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

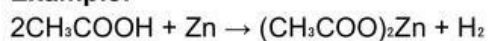
- Turns **blue litmus** → **red**
 - Produces **hydrogen ions (H⁺)** in solution
 - Reacts with:
 - Metals
 - Bases
 - Carbonates
-

7. REACTION WITH METALS

General form:

Acid + Metal → Salt + Hydrogen gas (H₂)

Example:



Key point:

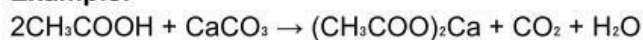
- Produces **hydrogen gas**
-

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**
-

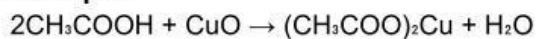


10. REACTION WITH METAL OXIDES

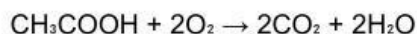
General form:

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:



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?"
-