Class 12 Chemistry – Chemistry in Everyday Life | Study Guide

1. Theory in Simple Words with Visuals

1.1 What is Chemistry in Everyday Life?

It is the **study of chemicals we use in daily life**, such as medicines, soaps, detergents, food additives, and preservatives.
Think of it as **"Chemistry all around us!"** – from brushing teeth to taking medicines.

1.2 Drugs and Chemotherapy

- **Drugs:** Substances used to **prevent, diagnose, or treat diseases**.
- **Classification:**

Type	Example	Use	Visual/Analogy
Analgesics	Paracetamol, Aspirin	Reduce pain/fever	"Paracetamol = Pain Vanisher"
Antibiotics	Penicillin, Tetracycline	Kill bacteria	"Antibiotics = Bacteria Fighter"
Antiseptics	Dettol, Savlon	Kill microbes on skin	"Surface cleaner"
Antipyretics	Aspirin	Reduce fever	"Fever Cooler"
Chemotherapy Drugs	Cisplatin	Cancer treatment	"Cancer Warrior"

Tip: Think **"Pain, Bacteria, Fever, Cancer"** → Analgesic, Antibiotic, Antipyretic, Chemotherapy.

1.3 Chemicals in Food

Type	Examples	Use
Preservatives	Sodium benzoate, Benzoic acid	Prevent spoilage
Artificial Sweeteners	Saccharin, Aspartame	Sugar substitute
Antioxidants	BHA, BHT	Prevent oxidation/rancidity
Coloring Agents	Tartrazine	Enhance appearance

Visual: Imagine food **"protected by invisible shields"** – preservatives and antioxidants.

1.4 Cleansing Agents

- **Soaps & Detergents** remove dirt and grease.
- **Soaps:** Sodium or potassium salts of fatty acids
- **Detergents:** Sulfonate salts (better in hard water)

Soap vs Detergent Table:

Feature	Soap	Detergent
Derived from	Natural fat	Synthetic
Hard water effect	Forms scum	Works well
Environment	Biodegradable	Sometimes non-biodegradable

Tip: Think **"Soap = Soft water friendly, Detergent = All water friendly"**

1.5 Polymers in Daily Life

- Plastic bags, bottles, utensils, nylon clothes, Teflon cookware.
- Types: Natural (Rubber), Synthetic (Nylon, PVC)

Fun Analogy: Monomer = Lego block → Polymer = Lego tower

1.6 Chemicals in Medicines

- Aspirin, Penicillin, Antacids, Antipyretics.
- Remember **"ABC" → Aspirin, Bacteria killer, Cancer drugs**

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2. Key Concepts & Formulas

Concept	Formula / Notes	Memory Trick
pH of antacids	pH ≈ 9-11	"Antacid neutralizes stomach"
Soap formation (Saponification)	Fat + NaOH → Glycerol + Soap	"Fat + Base = Clean"
Detergent formula	$R\text{-}SO_3^-Na^+$	R = hydrophobic tail, SO_3^- = hydrophilic head

Mnemonic for Drug Types: "Painful Bugs Avoid Chemotherapy"
(P = Painkiller, B = Antibiotic, A = Antipyretic, C = Chemotherapy)

3. Solved Numerical / Problem Examples

Example 1: Soap vs Detergent

Problem: Why soap is less effective in hard water?
Solution: Hard water contains Ca^{2+}, Mg^{2+} ions → soap forms insoluble scum.
Shortcut Tip: Think "**hard water + soap = scum**"

Example 2: pH Calculation

Problem: Antacid neutralizes HCl. If 0.1 M HCl reacts with $NaHCO_3$, find reaction?
Solution: $NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2$

- Tip: Neutralization reactions → water + salt ± gas

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4. Previous Years' Board Questions (Solved)

- Difference between **soap and detergent**
- Types of **medicines** with examples
- Reaction for **saponification**
- Uses of **preservatives and antioxidants**
- Write **chemical formula of a drug or detergent**

High-weightage: Soap/detergent, preservatives, drug classification.

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5. Quick Revision Notes / Important Points

- **Drugs:** Analgesic, Antibiotic, Antipyretic, Chemotherapy
- **Food Chemicals:** Preservatives, Sweeteners, Antioxidants, Coloring
- **Cleansing Agents:** Soap (scum in hard water), Detergent (works in hard water)
- **Polymers:** Natural (Rubber, Silk), Synthetic (Nylon, Teflon, PVC)
- **Saponification:** Fat + NaOH → Glycerol + Soap

Color-coded Symbols:

- 🔹 Drugs, 🔹 Polymers, 🔹 Detergents, 🔹 Preservatives

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6. Predicted / Likely Questions

1. Classification of drugs with examples
2. Difference between soap and detergent
3. Reaction of saponification
4. Biodegradable vs non-biodegradable polymers
5. Uses of preservatives, antioxidants, and sweeteners

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7. Exam Tips & Tricks

- Draw **flowcharts** for drug classification and soap/detergent differences
- Use **tables** for quick recall of polymers and food chemicals
- Always write **chemical formulas for reactions**
- Mnemonics help recall **types of drugs and food chemicals**

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8. Visual & Kid-Friendly Learning Style

Analogy:

- Soap = “Dirt remover shield”
- Detergent = “Super dirt fighter”
- Monomer → Lego block → Polymer = Lego tower
- Drugs = “Medicine army” → Painkiller, Antibiotic, Antipyretic, Cancer fighter

Flowchart Example:

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Chemistry in Everyday Life
├─ Drugs → Painkiller, Antibiotic, Antipyretic, Chemotherapy
├─ Food Chemicals → Preservatives, Sweeteners, Antioxidants, Coloring
├─ Cleansing Agents → Soap, Detergent
└─ Polymers → Natural (Rubber), Synthetic (Nylon, PVC)
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