Chemistry in Everyday Life Class 12 Key Points

CBSE Class 12 Chemistry · NCERT · for boards, NEET and JEE revision

ChapterNotes

How Drugs Work

Drug mass ≈ 100-500 u · used to treat = medicine · chemotherapy = treating disease with chemicals (Ehrlich)

Selective binding → treats disease with minimal side effects.

- Enzyme targets: drug = inhibitor (competitive at active site vs non-competitive/allosteric)
- Receptor targets: agonist mimics the messenger, antagonist blocks it
- Competitive inhibition is reversed by adding more substrate; non-competitive is not

Four Ways to Classify Drugs

Pharmacological effect · Drug action · Chemical structure · Molecular target

Classification by molecular target is most useful for medicinal chemists.

- Pharmacological effect: what the patient feels (e.g. all analgesics relieve pain)
- Drug action: the mechanism (e.g. antihistamines act on histamine)
- Molecular target groups drugs by the same protein → same mechanism → guides new drug design

Antacids & Antihistamines

$Mg(OH)_2 + 2\ HCl \rightarrow MgCl_2 + 2\ H_2O$ · H_1 = allergy, H_2 = acid

H_1-blocking antihistamines do NOT reduce acid - acid runs through H_2.

- Metal hydroxides/$NaHCO_3$ only neutralise acid, don't control its release
- Cimetidine (Tagamet) & Ranitidine (Zantac) block H_2 receptors → stop acid release
- Omeprazole/lansoprazole = proton pump inhibitors; Brompheniramine/Terfenadine block H_1

Tranquilizers

Antidepressants inhibit the enzyme that degrades noradrenaline → mood lifts

Barbiturates (veronal, luminal) are hypnotic/sleep-inducing, not painkillers.

- Antidepressants: Iproniazid, Phenelzine
- Anti-anxiety: Equanil (also lowers high BP), Chlordiazepoxide, Meprobamate, Valium (diazepam)
- Barbiturates are derivatives of barbituric acid; act as hypnotics

Analgesics

Aspirin = non-narcotic · inhibits prostaglandins → analgesic + antipyretic + anti-clotting

Morphine relieves severe pain but is addictive; overdose → stupor, coma, death.

- Non-narcotic (non-addictive): aspirin, paracetamol
- Narcotic (opioid): morphine, codeine, heroin - for postoperative/cancer/terminal pain
- Low-dose aspirin reduces platelet aggregation → helps prevent heart attacks

Antibiotics

Bactericidal = kill · Bacteriostatic = stop growth · Narrow vs Broad spectrum

First antibiotic = Penicillin (Fleming); Salvarsan (arsenic, Ehrlich) treated syphilis.

- Bactericidal: penicillin, ofloxacin, aminoglycosides
- Bacteriostatic: tetracycline, chloramphenicol, erythromycin, sulphonamides
- Penicillin G = narrow spectrum; chloramphenicol/tetracycline = broad spectrum

Antiseptics vs Disinfectants

Phenol: 0.2% = antiseptic, 1% = disinfectant (concentration decides!)

Same substance can be both - strength sets the role.

- Antiseptics: Dettol (chloroxylenol + terpineol), tincture of iodine, 0.2% boric acid (eyewash)
- Disinfectants: 1% phenol; chlorine 0.2-0.4 ppm in water; SO_2
- Antiseptic = wounds/skin; disinfectant = floors/instruments - never swap them

Chemicals in Food

Sweetness order: aspartame 100 < saccharin 550 < sucralose 600 < alitame 2000 (× cane sugar)

Aspartame = cold foods only (unstable on heating); sucralose is cookable.

- Preservatives: salt, sugar, sodium benzoate (C_6H_5COONa), sorbic/propanoic acid salts
- Saccharin & sucralose are heat-stable; aspartame decomposes on heating
- Antioxidants (BHT, BHA, SO_2) are oxidised before the food → prevent rancidity

Soaps & Detergents

Fat + 3 NaOH → Soap + Glycerol (saponification)

Soap fails in hard water (Ca^{2+}/Mg^{2+} scum); detergents' Ca/Mg salts stay soluble.

- Soap = Na/K salt of long-chain fatty acid; cleans by forming micelles
- Detergents: anionic (laundry/toothpaste), cationic (conditioners/germicides), non-ionic (dishwashing)
- Straight-chain detergents are biodegradable; branched-chain are non-biodegradable pollutants

Quick revision

- Analgesics: non-narcotic (aspirin, paracetamol) and narcotic (morphine)
- Antibiotics: bactericidal (kill) vs bacteriostatic (inhibit); broad vs narrow spectrum
- Antacids: simple ($NaHCO_3$), H_2 blockers (ranitidine), PPIs (omeprazole)
- Antiseptic: living tissue (dettol, iodine); Disinfectant: surfaces (1% phenol, Cl_2)
- Artificial sweeteners: saccharin (550×), aspartame (100×, no heat), alitame (2000×)
- Soap = RCOONa (fails in hard water → scum)
- Detergent = RSO_3Na (works in hard water → soluble Ca/Mg salts)
- Micelle: hydrophobic tail in grease + hydrophilic head in water → emulsification
- Biodegradable: linear chain; Non-biodegradable: branched chain
- Cationic detergents: germicidal → used in hair conditioners

Full chapter notes with solved examples and practice questions: **https://chapternotes.in/cbse/class-12-chemistry/chemistry-in-everyday-life-class-12-notes/**