

Characteristic Tests for Organic Compounds

Test	Observation	Inference
Appearance	Solid	Salts of acids, acids, phenol, (usually pink crystals)
Flammability	(a) readily ignites (b) sooty flame	(a) low C:H content, probably non-aromatic (b) unsaturated, aromatic, high C-content
+ H ₂ O	(a) immiscible (b) soluble (c) reacts violently – fumes of HCl	(a) most aromatics, H-C's, ethers: non-polar (b) polar groups (c) acid chlorides
Test solution with pH paper	(a) very weak acid (b) acidic (c) alkaline	(a) phenol: $\text{PhOH} + \text{H}_2\text{O} \rightarrow \text{PhO}^- + \text{H}_3\text{O}^+$ (b) organic acids $\text{RCO}_2\text{H} + \text{H}_2\text{O} \rightarrow \text{RCO}_2^- + \text{H}_3\text{O}^+$ (c) amine: $\text{RNH}_2 + \text{H}_2\text{O} \leftrightarrow \text{RNH}_3^+ + \text{OH}^-$
Br ₂ (TTE)	(a) decolourised immediately (b) decolourised with white ppt.	(a) -unsaturated, -ene or yne (electrophilic addition) (b) phenol: → 2,4,6-tribromophenol (white ppt) aniline: 2,4,6-tribromophenylamine (white ppt)
Oxidising Agent: MnO_4^- , $\text{Cr}_2\text{O}_7^{2-} + \text{H}^+$	Purple → colorless Orange → green	(a) unsaturated: ene or yne (b) oxidation: 1° alcohol → al → -oic (c) 2° ketone → aldehyde → acid
+Na	H _{2(g)}	Alcohols, acids (vigorous reaction) Phenol: OH group present in alcohol or phenol
+Na ₂ CO ₃	CO _{2(g)}	Acid (not alcohol), phenol: only dissolves
+NaOH	(a) dissolves (b) NH _{3(g)}	(a) acid or phenol (b) ammonium salt or an amide
+ 2,4-dinitrophenyl hydrazine	Yellow-orange-red ppte.	Alkanal or alkanone(ethanal → ethanal 2,4-dinitrophenyl hydrazone, etc.)
+ neutral FeCl _{3(aq)}	(a) red-brown ppte. (b) Violet-blue ppte.	(a) acids or salts of acids (b) phenols: - OH on benzene ring
Alkanoic acid + alkanol/conc. H ₂ SO ₄	Fruity, sweet smelling liquids	Esters formed ∴ alkanoic acid and alkanol present
+ HNO ₂ (NaNO ₂ + HCl)	Effervescence, N _{2(g)} , blue → colorless	1° amine 2° amine
+ PCl ₅	HCl fumes	- OH present on alkanoic or alkanol

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