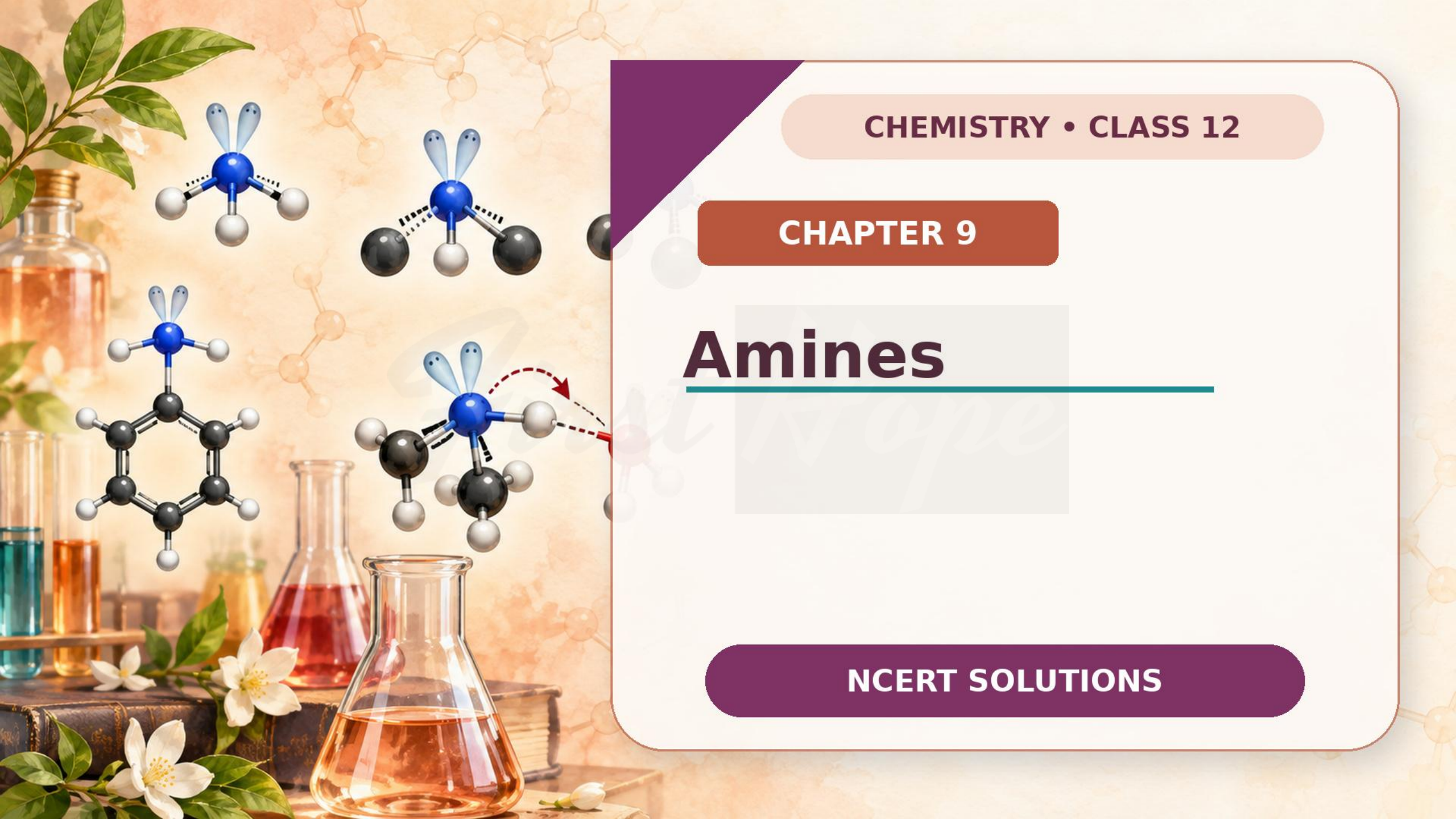


The background of the slide is a collage of chemistry-related images. On the left, there are glass bottles and test tubes containing liquids of various colors (orange, blue, red). In the foreground, there are white flowers and green leaves. Scattered throughout the background are several molecular models, including a benzene ring, a water molecule, and a methylamine molecule. The overall color scheme is warm, with orange and yellow tones.

CHEMISTRY • CLASS 12

CHAPTER 9

Amines

NCERT SOLUTIONS

NAME AND CLASSIFY AMINES: I-IV

Name and classify (i) $(\text{CH}_3)_2\text{CHNH}_2$, (ii) $\text{CH}_3(\text{CH}_2)_2\text{NH}_2$, (iii) $\text{CH}_3\text{NHCH}(\text{CH}_3)_2$, (iv) $(\text{CH}_3)_3\text{CNH}_2$.

Solution:

(i) $(\text{CH}_3)_2\text{CHNH}_2 \longrightarrow$ propan-2-amine — primary.

(ii) $\text{CH}_3(\text{CH}_2)_2\text{NH}_2 \longrightarrow$ propan-1-amine — primary.

(iii) $\text{CH}_3\text{NHCH}(\text{CH}_3)_2 \longrightarrow$ N-methylpropan-2-amine — secondary.

(iv) $(\text{CH}_3)_3\text{CNH}_2 \longrightarrow$ 2-methylpropan-2-amine — primary.

Classify an amine by the number of carbon groups directly attached to N.

NAME AND CLASSIFY AMINES: V–VII.

Question:

Name and classify (v) $C_6H_5NHCH_3$, (vi) $(CH_3CH_2)_2NCH_3$, (vii) $m\text{-}BrC_6H_4NH_2$.

Solution:

(v) $C_6H_5NHCH_3 \rightarrow$ *N*-methylbenzenamine (*N*-methylaniline) — secondary.

(vi) $(CH_3CH_2)_2NCH_3 \rightarrow$ *N*-ethyl-*N*-methylethanamine — tertiary.

(vii) $m\text{-}BrC_6H_4NH_2 \rightarrow$ 3-bromobenzenamine (3-bromoaniline) — primary.

Classification counts carbon groups directly bonded to nitrogen.

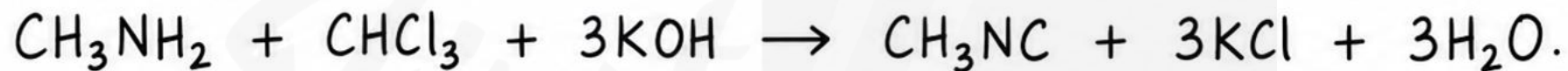
DISTINGUISH AMINES BY CHEMICAL TESTS: I-II

(i) Methylamine vs dimethylamine; (ii) Secondary vs tertiary amine.

(i) Solution:

Reagent: CHCl_3 + alcoholic KOH , warm (carbylamine test).

Methylamine (CH_3NH_2) gives pungent methyl isocyanide (CH_3NC):



Dimethylamine ($(\text{CH}_3)_2\text{NH}$) gives no isocyanide.

(ii) Solution:

Reagent: $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$ (Hinsberg reagent).

Secondary amine (R_2NH) forms N,N-disubstituted benzenesulfonamide ($\text{C}_6\text{H}_5\text{SO}_2\text{NR}_2$), which is insoluble in NaOH .

Tertiary amine (R_3N) forms no sulfonamide; it dissolves in dilute HCl as $[\text{R}_3\text{NH}]\text{Cl}$.

DISTINGUISH AMINES BY CHEMICAL TESTS: III-V

Tests for (iii) ethylamine/aniline, (iv) aniline/benzylamine, (v) aniline/*N*-methylaniline.

Solution (iii):

Add cold NaNO_2/HCl (273–278 K). Ethylamine releases N_2 gas; aniline makes stable benzenediazonium chloride, no gas.

Solution (iv):

Add cold NaNO_2/HCl . Aniline makes stable benzenediazonium chloride; benzylamine releases N_2 gas and forms benzyl alcohol.

Solution (v):

Warm with CHCl_3 + alcoholic KOH (carbylamine test). Aniline gives pungent phenyl isocyanide; *N*-methylaniline gives no isocyanide.

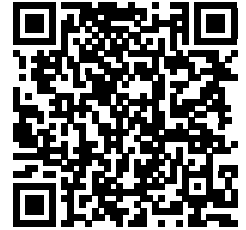


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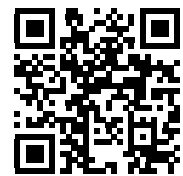


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