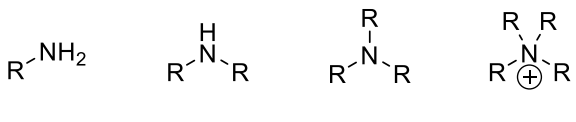
Karlsruher Institut für Technologie

Organische Chemie I – Teil 18

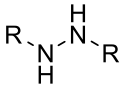
Stefan Bräse
Institut für Organische Chemie & Institut für Biologische und Chemische Systeme

Übersicht

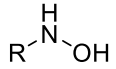


Amine

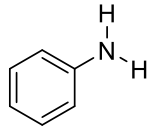
Ammonium



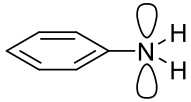
Hydrazine

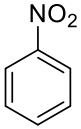


Hydroxylamine

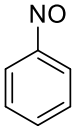


Anilin



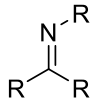


Nitro-Verbindungen

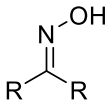


Nitroso-Verbindungen

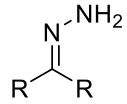
Azide



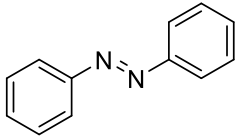
Imine



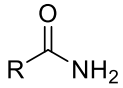
Oxime



Hydrazone

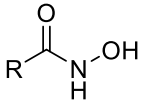


Azo-Verbindungen

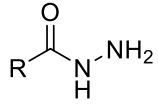


Amide

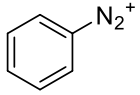
Nitrile



Hydroxamsäuren



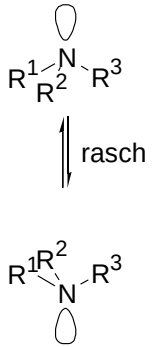
Hydrazide

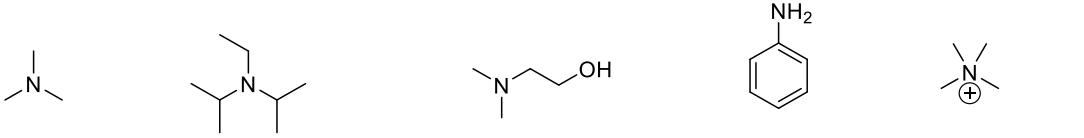


Diazonium-Verbindungen

Amine

- Alkylamine oder Aminoalkane
- Aliphatische Amine sind sp^3-hybridisiert
- basisch und nucleophil



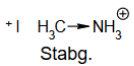
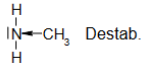
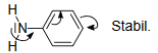


Trimethylamin | Ethyldiisopropylamin | 2-(*N*,*N*-Dimethylamino)ethanol | Anilin | Tetramethylammonium

Amine

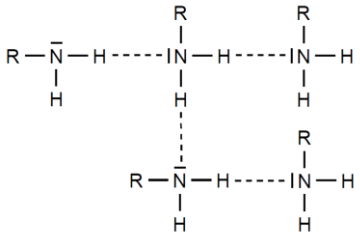
- basisch und nucleophil

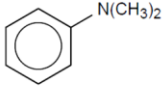
Ammonium-Derivat	pK_a
$MeNH_3^+$	10.6
$EtNH_3^+$	10.8
$Et_2NH_2^+$	11.0
Et_3NH^+	10.8
$PhNH_3^+$	4.6
$PhCH_2NH_3^+$	9.3

Konjugierte Säure	pK_s	Konjugierte Base
	9.25	
	10.6	
	4.6	
	0.8	

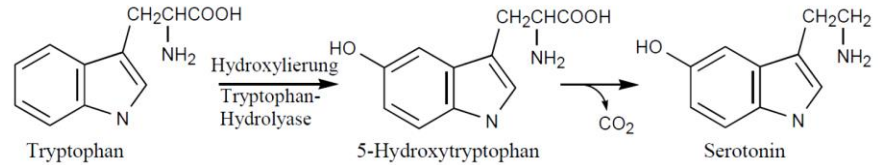
Amine

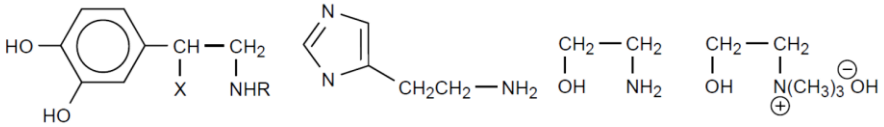
- Wasserstoffbrückenbindungen

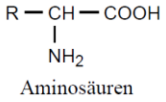


Name	Formel	Smt.	Sdt.	Name	Formel	Smt.	Sdt.
Methylamin	CH_3NH_2	–92	–6,5	*n*-Propylamin	$C_3H_7NH_2$	–83	49
Dimethylamin	$(CH_3)_2NH$	–96	7	*n*-Butylamin	$C_4H_9NH_2$	–50	78
Trimethylamin	$(CH_3)_3N$	–117	3	Anilin	$C_6H_5NH_2$	–6	184
Ethylamin	$CH_3CH_2NH_2$	–80	17	Diphenylamin	$(C_6H_5)_2NH$	53	302
Diethylamin	$(CH_3CH_2)_2NH$	–39	55				
Triethylamin	$(CH_3CH_2)_3N$	–115	89	N,N-Dimethyl-anilin		2,4	194

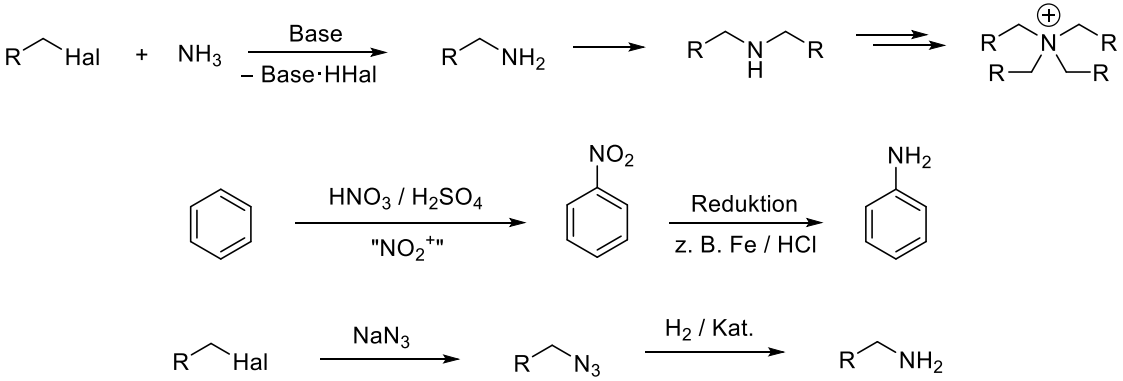
Amine – Vorkommen



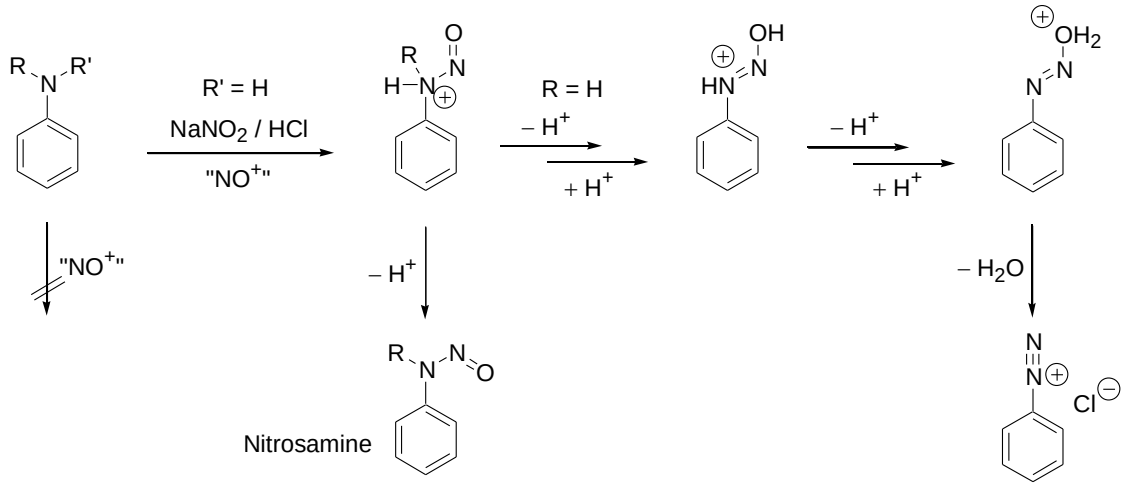




Aminsynthese

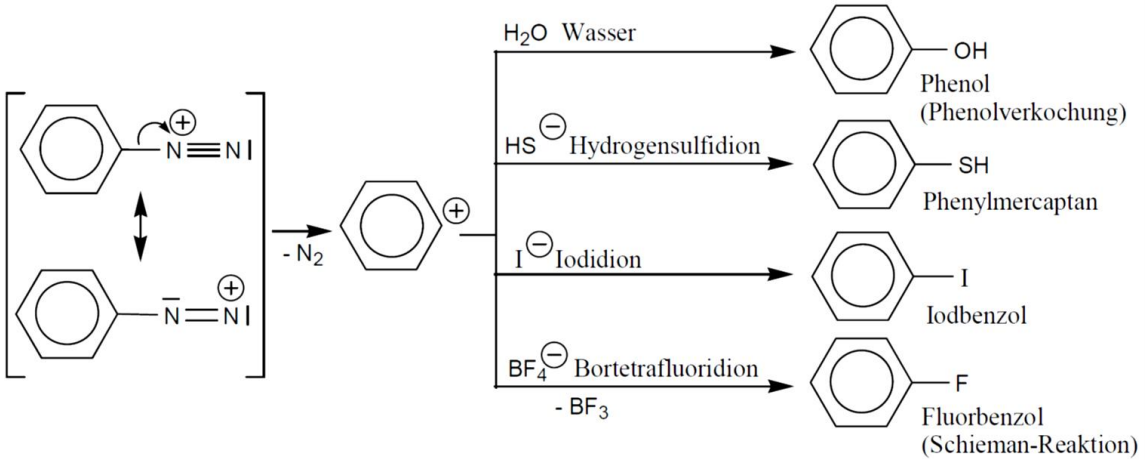


Amine – Reaktionen



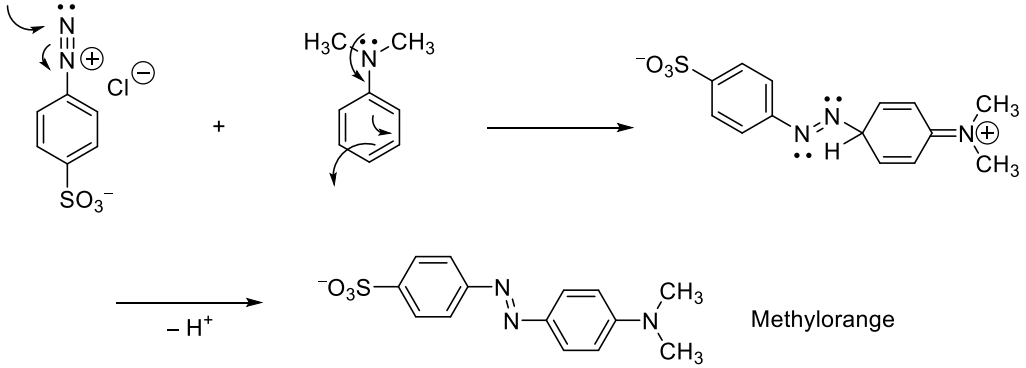
Diazonium-Verbindungen I

- Sehr schwache Elektrophile
- N_2-Abspaltung bei leichter Erhitzung



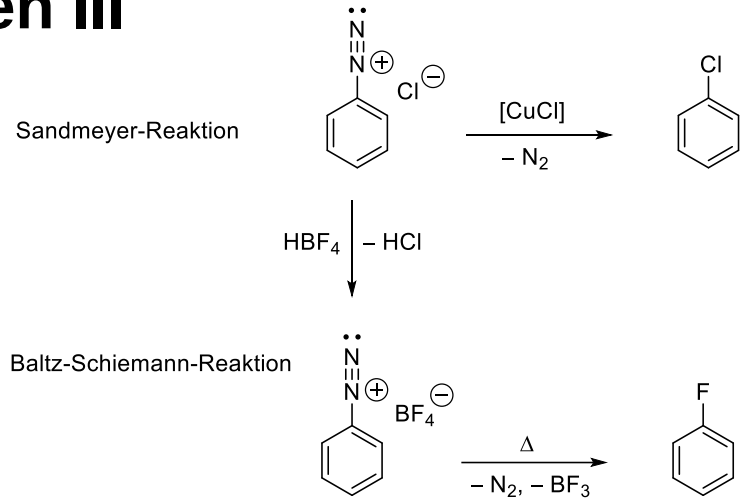
Diazonium-Verbindungen II

- Reaktion mit sehr aktivierten Aromaten zu Azo-Verbindungen – Azo-Kupplung
- Typischer Vertreter: Methylorange

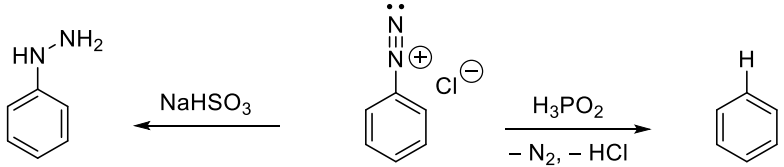


Diazonium-Verbindungen III

- Diazoniumsalze als nützliche Intermediate:

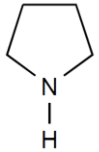


- Umsetzung mit Natriumhydrogensulfit oder unterphorsphoriger Säure:



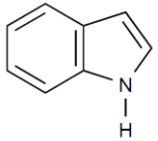
Alkaloide

- Alkaloide mit Pyrrolidinstruktur



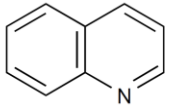
Pyrrolidin (Tetrahydropyrrol)

- Alkaloide mit Indolstruktur



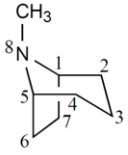
Indol

- Alkaloide mit Chinolinstruktur

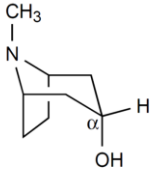


Chinolin

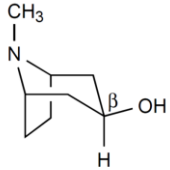
- Tropan-Alkaloide



Tropan

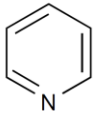


Tropin
(Tropan-3α-ol)

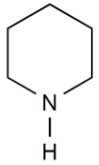


Pseudotropin
(Tropan-3β-ol)

- Alkaloide mit Pyridin- und Piperidinstruktur

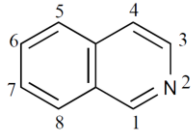


Pyridin

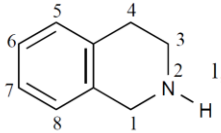


Piperidin

- Morphin- und Isochinolin-Alkaloide



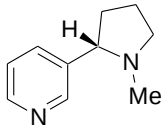
Isochinolin



1,2,3,4-Tetrahydroisochinolin

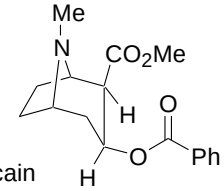
Alkaloide

Tetrahydropyrrol, Pyridin, Piperidin-Typ



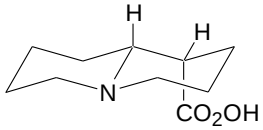
Nicotin

Tropan-Typ



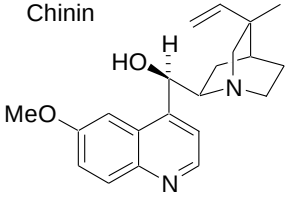
Cocain

Chinolizidin-Typ

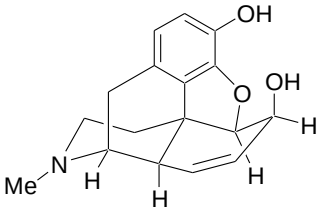


(–)-Lupinin

Chinolin-Typ

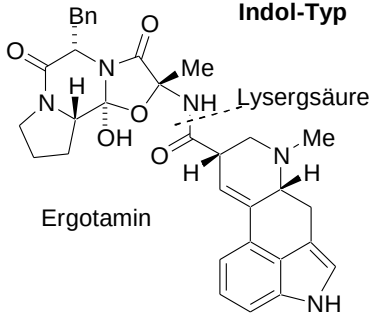


Isochinolin-Typ



Morphin

Indol-Typ



Ergotamin

Fragen?