

## ORGANIC REAGENTS

S.No.	Reagent	Function
1	$\text{PCl}_3, \text{PBr}_3, \text{PI}_3$	Alcohols into Alkyl halides
2	$\text{SOCl}_2, \text{PCl}_5$	Alcohols into Alkyl chlorides & Carboxylic acids into Acid Chlorides
3	$\text{HCl}/\text{ZnCl}_2, \text{HBr}, \text{HI}$	Alcohols into alkyl halides
4	$\text{Cl}_2/\text{Fe}$ or $\text{FeCl}_3$	Cl group substituting on Benzene
5	$\text{NaNO}_2 / \text{HCl}$ 0-5 <sup>0</sup> C	Diazotisation
6	$\text{CuCl}, \text{CuBr}, \text{CuCN}, \text{KI}, \text{H}_2\text{O}, \text{H}_3\text{PO}_2$	Diazonium Chloride into Chlor Benzene, Bromo Benzene, Benzo nitrile, Iodo Benzene , Phenol, Benzene respectively
7	$\text{HBF}_4$ or $\text{NaBF}_4$	Diazonium Chloride into Fluoro Benzene
8	$\text{AgF}$ or $\text{Hg}_2\text{F}_2$ or $\text{SbF}_3$ or $\text{CoF}_2$	Alkyl halides into alkyl fluorides
9	$\text{Na}$ / dry ether	Alkyl halides into alkanes
10	$\text{NaOH}$ 623/443/368K	Chloro benzene to phenol
11	$\text{Br}_2 / \text{FeBr}_3$	Bromination of Benzene
12	$\text{Cl}_2 / \text{FeCl}_3$	Chlorination of Benzene
13	$\text{CH}_3\text{Cl} / \text{AlCl}_3$	alkylation of benzene and its derivatives
14	$\text{CH}_3\text{COCl} / \text{AlCl}_3$	Acylation on benzene
15	$\text{H}_2\text{SO}_4 / \text{HNO}_3$	Nitration of benzene
16	$(\text{CH}_3\text{CO})_2\text{O} / \text{AlCl}_3$	O – Acylation of Phenol
17	$\text{H}_2\text{SO}_4$	Sulphonation on Benzene
18	$\text{H}_2\text{O} / \text{H}_2\text{SO}_4$	alkenes into alcohols
	Aq KOH	Alkyl halide into alcohol
19	$\text{BH}_3 / \text{H}_2\text{O}_2 / \text{OH}^-$	Alkenes into alcohols (Anti Markownikoff product)
20	$\text{NaBH}_4 / \text{LiAlH}_4 (\text{LAH})$	Aldehydes, ketones, acids into alcohols, Nitriles & Cyanides , Isocyanides into amines
21	$\text{H}_2 / \text{Ni}$ or $\text{H}_2 / \text{Pd}$	reduction of aldehydes, ketones and cyanides
22	$\text{RMgX} / \text{H}_3\text{O}^+$	Aldehydes, ketones into alcohols
23	$\text{O}_2 / \text{H}^+$	Cumene to phenol
24	$\text{Na}$	Alcohol or phenol into Sodium alkoxide/Phenoxide
25	$(\text{CH}_3\text{CO})_2\text{O} / \text{CH}_3\text{COCl}$	O acylation on phenol or N acylation on Aniline or amine
26	Conc. $\text{H}_2\text{SO}_4 / 443\text{K}$	Conversion of primary alcohols into Alkenes
27	Conc. $\text{H}_2\text{SO}_4 / 410\text{K}$	Conversion of alcohols into Ethers
28	85% $\text{H}_3\text{PO}_4 / 440\text{K}$	Secondary alcohol into alkene
29	20% $\text{H}_3\text{PO}_4 / 358\text{K}$	Tertiary alcohol into alkene
	Alcoholic KOH	Alkyl halide into alkene
30	$\text{CrO}_3 / \text{KMnO}_4$ or $\text{K}_2\text{Cr}_2\text{O}_7$ in acidic medium	oxidation of alcohols into acids
31	$\text{Cu} / 573\text{K}$	dehydrogenation of alcohols gives 1 <sup>0</sup> alcohols into aldehydes and 2 <sup>0</sup> alcohols into ketones & 3 <sup>0</sup> alcohols into alkenes
32	Dil. $\text{HNO}_3$	Mono nitration of Phenol
33	Conc. $\text{HNO}_3$	tri nitration of phenol
34	$\text{Br}_2 / \text{H}_2\text{O}$	tri bromination of phenol
35	$\text{Br}_2 / \text{CS}_2$	mono bromination of phenol
36	$\text{NaOH} / \text{CO}_2$	Phenol to salicylic acid

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37	$\text{CHCl}_3/\text{NaOH}$	Phenol to salicylaldehyde
38	Zn dust	Phenol to Benzene
39	$\text{Na}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ or air	Phenol to Benzo quinone
40	$\text{Zn}/\text{Cr}_2\text{O}_3$ 200to 300 atm 573 – 673K	CO & H into methanol
41	Invertase	Sucrose into Glucose or Fructose
42	Zymase	Glucose or Fructose into ethanol
43	HI	Ether into alcohol & alkyl halide
44	PCC	alcohol to aldehyde
45	$\text{Pd}/\text{BaSO}_4, \text{H}_2$	acid chloride into aldehyde
46	$\text{SnCl}_2/\text{HCl}/\text{H}_3\text{O}^+$	Cyanides into aldehydes
47	$\text{AlH}(\text{i-Bu})_2/\text{H}_2\text{O}$	Cyanides into aldehydes
48	DIBAL-H/ $\text{H}_2\text{O}$	Esters into aldehydes
49	$\text{CrO}_2\text{Cl}_2/\text{H}_2\text{O}$	Toluene to aldehyde
50	$\text{CrO}_3/(\text{CH}_3\text{CO})_2\text{O}$	Toluene into Benzaldehyde
51	$\text{Cl}_2/h\nu$	Chlorination on alkyl group of Benzene or alkane
52	CO, HCl anhydrous $\text{AlCl}_3$	Benzene to Benzaldehyde
53	$(\text{CH}_3)_2\text{Cd}$	acid chloride into ketones
54	$\text{RMgX}/\text{H}_3\text{O}^+$	Cyanides into ketones
55	HCN	Carbonyl compound into cyanohydrin
56	$\text{NaHSO}_3$	addition to aldehyde and ketone
57	$\text{H}_2\text{NOH}$	carbonyl compound into oxime
58	$\text{H}_2\text{N-NH}_2$	carbonyl compound into hydrazone
59	$\text{H}_2\text{N-NH-Ph}$	carbonyl compound into Phenyl hydrazone
60	2,4DNP	carbonyl compound into 2,4 dinitro phenyl hydrazone
61	$\text{H}_2\text{N-NH-CO-CH}_3$	carbonyl compound into semi carbazide
62	$\text{ROH}/\text{HCl}$	Aldehydes & ketones into hemiacetal and acetal
63	$\text{HO-CH}_2\text{-CH}_2\text{-OH}/\text{HCl}$	Aldehyde or ketone into ethylene glycol ketone
64	$\text{Zn-Hg}/\text{HCl}$	carbonyl compound into alkane
65	$\text{H}_2\text{N-NH}_2/\text{KOH}$	carbonyl compound into alkane
66	$\text{KMnO}_4/\text{OH}^-/\text{K}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ or $\text{HNO}_3$	Ketones into mixture of carboxylic acids on prolonged oxidation
67	$(\text{Ag}(\text{NH}_3)_2)\text{NO}_3+\text{NaOH}$	Tollen's test
68	$\text{Cu}(\text{OH})_2$	Fehling's test
69	$\text{NaOH}+\text{I}_2$	Iodoform
70	$\text{NaOH}$ or $\text{Ba}(\text{OH})_2$	aldal condensation
71	Conc KOH or NaOH	Cannizaro's reaction
72	$\text{KMnO}_4/\text{KOH}$	Toluene/alkyl Benzene into Benzoic Acid
73	$\text{H}_2\text{O}/\text{H}^+$	Cyanides into carboxylic acids, amides into carboxylic acids, esters into carboxylic acid and alcohols, acid chlorides or anhydrides into carboxylic acids
74	NaOH	Saponification of ester, acid into salt of acid
75	$\text{Na}_2\text{CO}_3$ or $\text{NaHCO}_3$	Carboxylic acid test
76	$\text{P}_4\text{O}_{10}$ or $\text{P}_2\text{O}_5$	Dehydration of acids into anhydride,

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		amides into nitriles
77	ROH/conc H <sub>2</sub> SO <sub>4</sub>	Carboxylic acids into esters
78	PCl <sub>3</sub> , SOCl <sub>2</sub> , PCl <sub>5</sub>	Carboxylic acids into acid chlorides
79	NH <sub>3</sub> heating	Carboxylic acids into amides
80	NaOH/CaO	Decarboxylation (acids into alkanes)
81	LiAlH <sub>4</sub>	Carboxylic acids into alcohols, amides into amines
82	Cl <sub>2</sub> /red.P <sub>4</sub>	HVZ reaction
83	Sn /HCl or Fe /HCl, H <sub>2</sub> /Pd	Reduction of nitro compounds into amines
84	NH <sub>3</sub>	Alkyl halides into amines
85	H <sub>2</sub> / Ni or H <sub>2</sub> /Pd LiAlH <sub>4</sub>	Amides into cyanides
86	KOH/R-X	Phthalamide into amine
87	NaOH /Br <sub>2</sub>	Hoffman bromamide, amide into amine with one 'C' less
88	KOH,CHCl <sub>3</sub>	Amines into Carbyl amines
89	NaNO <sub>2</sub> /HCl	1 <sup>o</sup> aliphatic amines into alcohols
90	NaNO <sub>2</sub> /HCl 0 – 5 <sup>o</sup> C	Aniline into diazonium chloride
91	C <sub>6</sub> H <sub>5</sub> SO <sub>2</sub> Cl	Distinguishing 1 <sup>o</sup> , 2 <sup>o</sup> & 3 <sup>o</sup> amines
92	Br <sub>2</sub> /H <sub>2</sub> O	Aniline into tri bromo aniline
93	Br <sub>2</sub> / CH-CO-Cl /(CHCO) <sub>2</sub> O	Aniline into Bromo Aniline
94	HNO <sub>3</sub> / CH-CO-Cl /(CHCO) <sub>2</sub> O	Nitro aniline
95	H <sub>2</sub> SO <sub>4</sub>	Sulphonation on aniline
96	CuCl, CuBr, CuCN, KI, H <sub>2</sub> O, H <sub>3</sub> PO <sub>2</sub> or CH <sub>3</sub> -CH <sub>2</sub> -OH	Diazonium Chloride into Chlor Benzene, Bromo Benzene, Benzo nitrile, Iodo Benzene , Phenol, Benzene respectively

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