 Lowy, Alexander

Organic type formulas

July 1891.

ORGANIC TYPE FORMULAS

COMPILED BY

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NEW YORK
D. VAN NOSTRAND COMPANY
EIGHT WARREN STREET
1920

ORGANIC TYPE FORMULAS

ALIPHATIC SERIES

COLUMN I

HYDROCARBONS

SATURATED	UNSATURATED	
PARAFFINS = C_nH_{2n+2} ALKANES	OLEFINES = C_nH_{2n} ALKENES	ACETYLENES = C_nH_{2n-2} ALKINES
H_3C-CH_3 METHANE		
$H_3C-CH_2-CH_3$ ETHANE	$H_2C=CH_2$ ETHYLENE or ETHENE	$HC\equiv CH$ ACETYLENE or ETHINE

ALKYL HALIDES

H_3C-Cl METHYL CHLORIDE or MONOCHLOROMETHANE

R-X

X = HALOGEN
R = ALKYL
ALKYL GROUP = R (CH_3, C_2H_5, C_nH_{2n+1})

ALCOHOLS

H_3C-OH METHANOL or METHYL ALCOHOL

-OH ALCOHOL GROUP

H_3C-ONa SODIUM METHOXIDE or SODIUM METHYLATE

$R-CH_2-OH$ PRIMARY ALCOHOL

R_2CH-OH SECONDARY

R_3C-OH TERTIARY

ETHERS

$H_3C-O-CH_3$ METHYL ETHER

-O- ETHER GROUP

R-O-R ETHERS

ALDEHYDES

H_3C-CHO ETHANAL or ACETALDEHYDE

-CHO ALDEHYDE GROUP

R-CHO ALDEHYDES

KETONES

$H_3C-CO-CH_3$ PROPANONE or ACETONE

-CO- KETONE GROUP

R-CO-R KETONES

>C=O = CARBONYL GROUP

ACIDS

$H_3C-COOH$ ETHANOIC ACID or ACETIC ACID

-COOH CARBOXYL GROUP

R-COOH ACIDS

ACID DERIVATIVES

$H_3C-COONa$ SODIUM ACETATE

-COOM SALT GROUP (M = METAL)

R-COOM SALTS

$H_3C-COOCH_3$ METHYL ACETATE

-COOR ESTER GROUP

R-COOR ESTERS

DERIVATIVES CONTINUED ABOVE

COLUMN II

$H_3C-CO-O-CO-CH_3$ ACETIC ANHYDRIDE

-CO-O-CO- ANHYDRIDE GROUP

R-CO-O-CO-R ANHYDRIDES

$H_3C-CONH_2$ ACETAMIDE

-CONH₂ AMIDE GROUP

R-CONH₂ AMIDES

$H_3C-COCl$ ACETYL CHLORIDE

R-CO- ACYL GROUP

R-COX ACYL HALIDES

SUBSTITUTED ACIDS

$H_3C-COOH$

$H_2C(Cl)-COOH$ CHLOROACETIC ACID

$H_2C(OH)-COOH$ HYDROXYACETIC ACID

$H_2C(NH_2)-COOH$ AMINOACETIC ACID

$H_2C(CN)-COOH$ CYANOACETIC ACID

$H_2C(COOH)_2$ MALONIC ACID

AMINES

$N(H)(H)(CH_3)$ METHYL AMINE

$N(H)(CH_3)(CH_3)$ DIMETHYL AMINE

$N(CH_3)(CH_3)(CH_3)$ TRIMETHYL AMINE

NH_3 AMMONIA

$N(H)(H)(R)$ PRIMARY AMINE

$N(H)(R)(R)$ SECONDARY

$N(R)(R)(R)$ TERTIARY

$R-O-N=O$ NITRITES

$R-NO_2$ NITRO COMPOUNDS

$R-O-NO_2$ NITRATES

NITRILES or ALKYL CYANIDES

$H_3C-C\equiv N$ ACETONITRILE or METHYL CYANIDE

$-C\equiv N$ NITRILE GROUP

$R-C\equiv N$ NITRILES

ISONITRILES or CARBYLAMINES

$H_3C-N\equiv C$ METHYL ISOCYANIDE or METHYL CARBYLAMINE

$-N\equiv C$ CARBYLAMINE GROUP

$R-N\equiv C$ CARBYLAMINES

SULFUR COMPOUNDS

H_3C-SH METHYL MERCAPTAN

-SH MERCAPTAN GROUP

R-SH MERCAPTANS

$H_3C-S-CH_3$ METHYL SULFIDE

-S- THIO-ETHER GROUP

R-S-R THIO-ETHERS

R-S-S-R DISULFIDES

R-S-M MERCAPTIDES

R-COSH THIO-ACIDS

$R_2S=O$ SULFOXIDES

R_2SO_2 SULFONES

$R-SO_2-OH$ SULFONIC ACIDS

METALLIC ALKYL COMPOUNDS

$Mg(Br)(C_2H_5)$ MAGNESIUM ETHYL BROMIDE

$Zn(C_2H_5)_2$ ZINC ETHYL

MX_2 M = Mg, Zn, etc

MR_2 = METALLIC ALKIDES

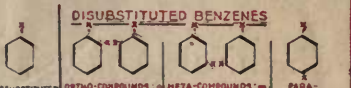
ORGANIC TYPE FORMULAS

AROMATIC SERIES

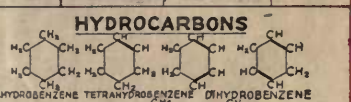
COLUMN I

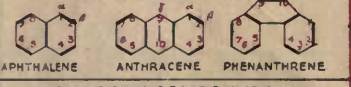
BENZENE

DISUBSTITUTED BENZENES

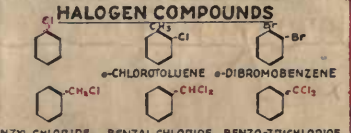


HYDROCARBONS

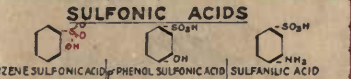




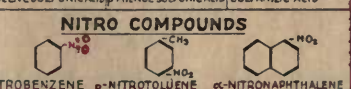
HALOGEN COMPOUNDS



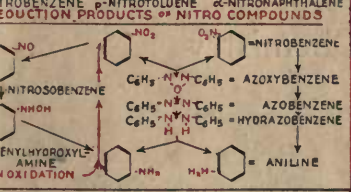
SULFONIC ACIDS



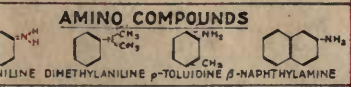
NITRO COMPOUNDS



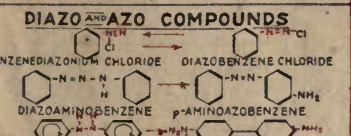
REDUCTION PRODUCTS OF NITRO COMPOUNDS



AMINO COMPOUNDS

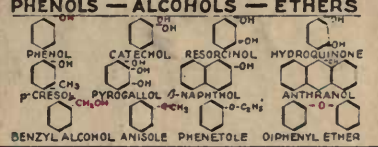


DIAZO AND AZO COMPOUNDS

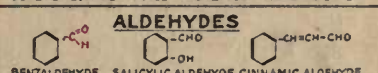


COLUMN II

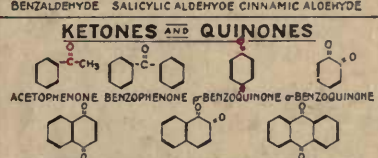
PHENOLS — ALCOHOLS — ETHERS



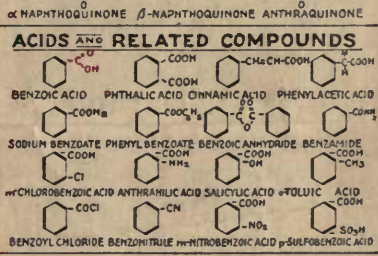
ALDEHYDES



KETONES AND QUINONES



ACIDS AND RELATED COMPOUNDS



RULES FOR SUBSTITUTION

PRESENT IN POSITION	POSITION ENTERED BY SUBSTITUENTS						
	ALKYL	Cl	Br	I	NO_2	SO_3H
ALKYL	4(2)	4(2)	4(2)	4(2)	4(2M3)	4(2M3)
Cl	4(2)	4(2M3)	4(2M3)	4	4(2)	4
Br	4(2)	4(2M3)	4(2M3)		4(2)	4
I		4	4	4	4(2)	4
OH	4(2)	4(2)	4(2)	4(2)	4(2)	4(2)
NH_2	4(2)	4(2)	4	4	4(2)	4(2)
NO_2	4(2)	3	3		3(2,4)	3(2,4)
SO_3H	4(2)		3		3(2,4)	3(4)
COOH	4(2)	3	3	3	3(2,4)	3(4)
CN			4		3	

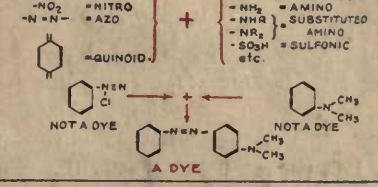
CHARACTERISTIC GROUPS IN DYESTUFFS

CHROMOPHORE GROUPS

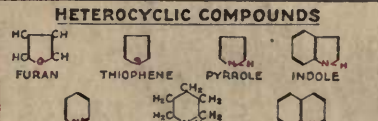
-NO = NITROSO
$-NO_2$ = NITRO
-N=N- = AZO
= QUINOID

AUXOCHROME GROUPS

-OH = HYDROXYL
$-NH_2$ = AMINO
-NHR, $-NR_2$ = SUBSTITUTED AMINO
$-SO_3H$ = SULFONIC
etc.



HETEROCYCLIC COMPOUNDS



Heavy Lines indicate Double Bonds. **Light Lines indicate Single Bonds.**