

FAMILIES OF ORGANIC COMPOUNDS

FAMILY	ALKANE	ALKENE	ALKYNE	ALKYL HALIDE	AROMATICS	ALCOHOL	ETHER	ALDEHYDE	KETONE	CARBOXYLIC ACID	ESTER	AMINE	AMIDE	NITRILE
General Formula	C_nH_{2n+2}	C_nH_{2n}	C_nH_{2n-2}	R-X (X=F, Cl, Br, I)	Ar-H	R-O-H	R-O-R'	R-CHO	R-CO-R'	R-COOH	R-COO-R'	R-NH₂	R-CO-NH₂	R-CN
IUPAC Name	-ANE	-ENE	-YNE	fluoro.....	*Benzene **Phenyl	-OL	R-R' ether	-AL	-ONE	-OIC Acid	R',R-OATE	R-Amine	R-Amide	Cyano-onitrile
Example	C_2H_6 ethane	C_2H_4 ethene	C_2H_2 ethyne	C_2H_5F fluoroethane $CH_2=CHCl$ chloroethene	C_6H_6 benzene CH_2-CH_3 phenylethane	C_2H_5OH ethanol	CH_3OCH_3 dimethyl-ether	CH_3CHO ethanal	CH_3COCH_3 propanone	CH_3COOH ethanoic acid	CH_3COOCH_3 methyl-ethanoate	$CH_3CH_2NH_2$ ethylamine	CH_3CONH_2 ethylamide	CH_3CH_2CN cyanoethane Propano-nitrile
Physical Properties	Bonds-109° sp ³ hybrids Non-polar Insoluble Low MP/BP	Bonds-120° sp ² hybrids Non-polar Insoluble Low MP/BP	Bonds-180° sp hybrids Non-polar Insoluble Low MP/BP	-made from alkanes/enes/ynes -mixed polar/non-mixed solubilities -variable BP	-bonds 120° -very stable ring structure -non-polar -insoluble	-active oxygen -higer BP (hydrogen bonding) -more soluble	-inactive oxygen -low BP (no hydrogen bonding) -not soluble -volitile	-very polar oxygen -low BP (no hydrogen bonding) -are soluble	-very polar oxygen -higher BP (no hydrogen bonding) -are soluble	-very polar oxygen -higher BP (hydrogen bonding) -1 st 4 are soluble -pungent -corrosive	-good solvent -low BP -insoluble -very pleasant odours	-fishy ammonia smell -organic base lone pair e ⁻ -some Hyd bonding -soluble	-very polar (CO & NH ₂) -high BP -soluble -no longer a base	-polar -high BP -very stable -solvent -non-toxic
Chemical Properties & Behaviours	-Combustion -Substitution	-Combustion -Addition	-Combustion -Addition (*2)	-Combustion -Further Substitution	-Combustion -Substitution	-many rxs -combustion -esterification -oxidation	-low activity -very combustable -oxidation	-very active -oxidize easily to acids -addition	-Oxidize with difficulty to acids -addition	-behave like inorganic acids -esterification		-act like weak bases	-act like weak bases -hydrolyzed to acids/amines	-hydrolyzed to acids -hydrolyzed to amides
Occurance/Uses	-fuels -natural gas -building blocks for petrochemical industry	-fuels -starting materials for many polymers	-good fuels (welding) -produced in some plants and animals	anaesthetics, & antiseptics, refrigerants, insect repellants -propellant -heavy duty lubricants	-very diverse -benzene, toluene & xylene used as solvents -foods -drugs-explosive derivatvns found widely in nature	-*very diverse* -beveridges -foods -cosmetics -antifreeze	-anaesthetic -solvents -combustable materials -extracting agent	-made from oxidizing primary alcohols	-made from oxidizing secondary alcohols	-occur commonly in many foods -soaps -waxes	-used as solvents and artificial flavours -found in animal fats/vegetable oils -soaps/detergents	-produced in biodegradation of proteins -used to make dyes -food industry, -pharmaceuticals -polymers	-used to make polymers like nylon -used to make protein molecules	