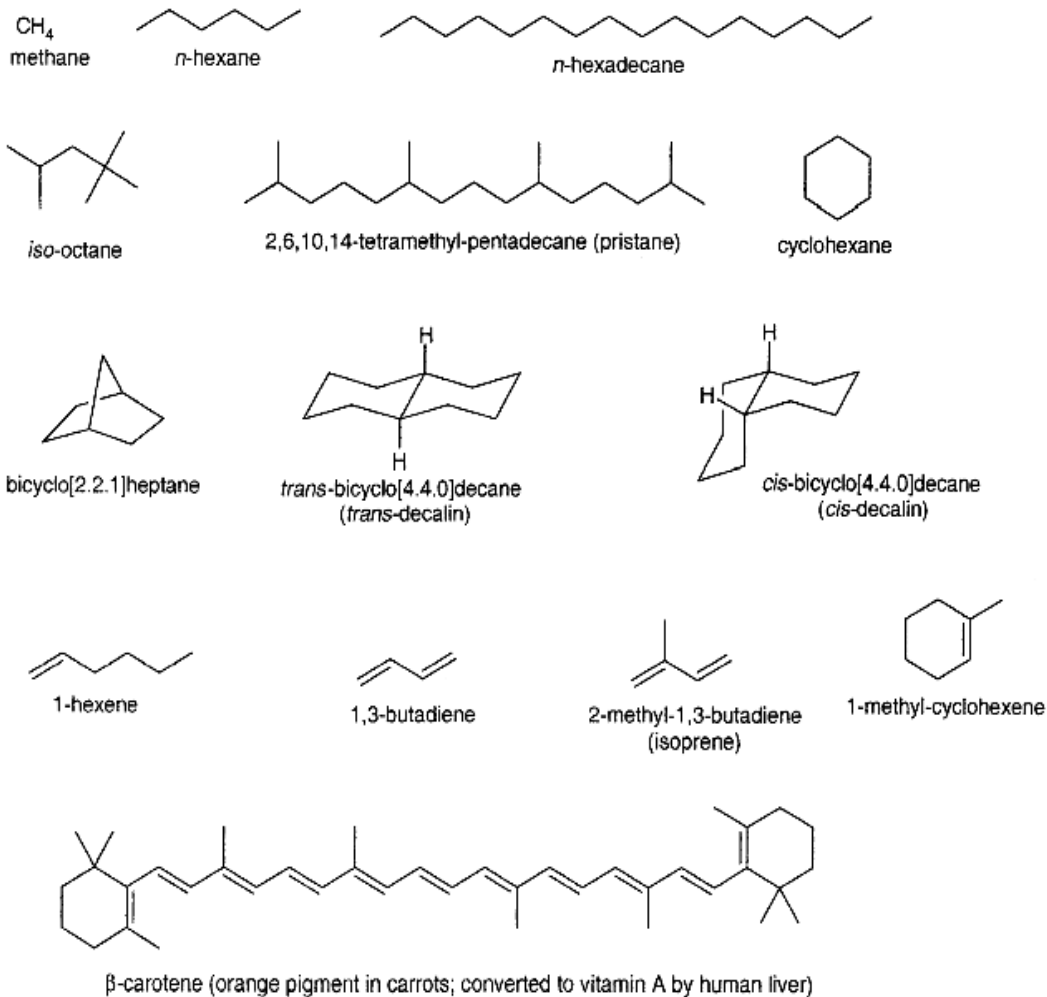


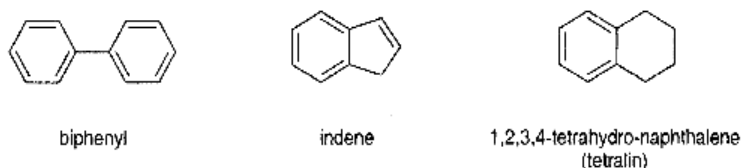
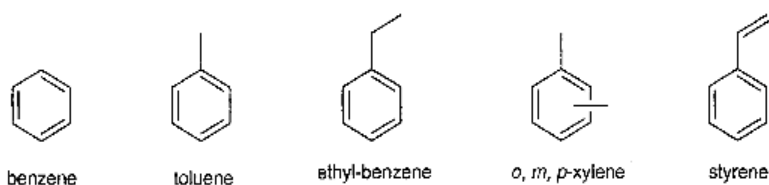
Important Classes of Environmentally Relevant Organic Compounds

Adapted from Environmental Organic Chemistry, 2nd Ed., R.P. Schwarzenbach, 2003

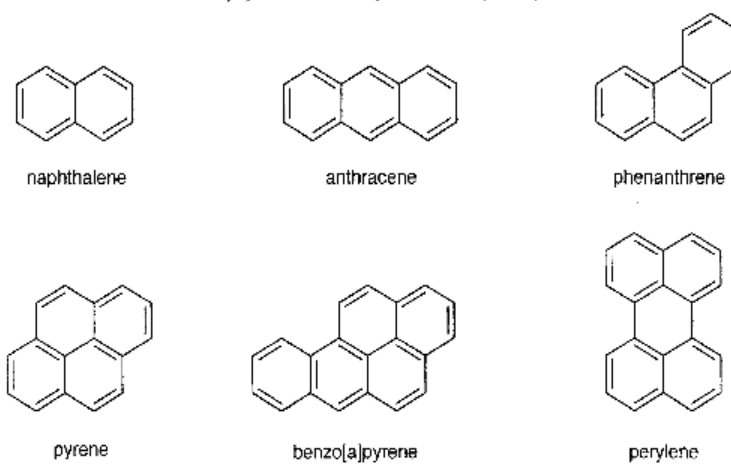
Examples of Aliphatic, Alicyclic and Olefinic Hydrocarbons



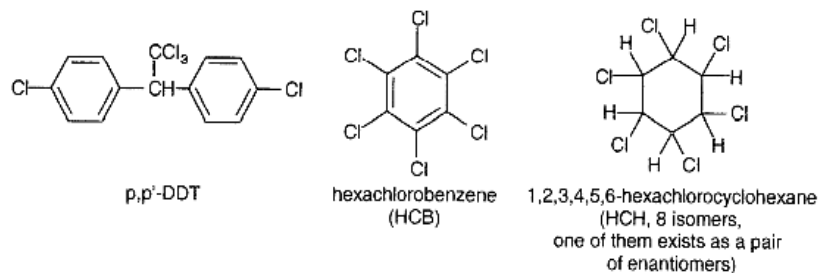
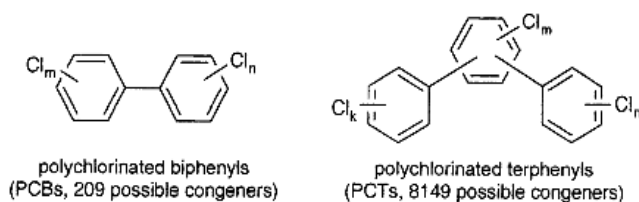
Examples of Aromatic Hydrocarbons



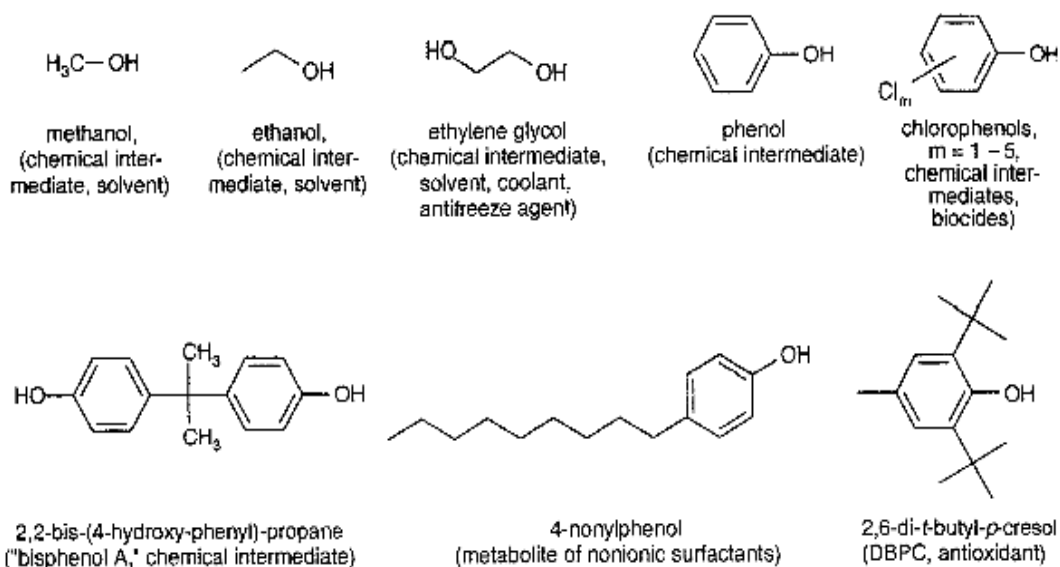
Polycyclic Aromatic Hydrocarbons (PAHs)



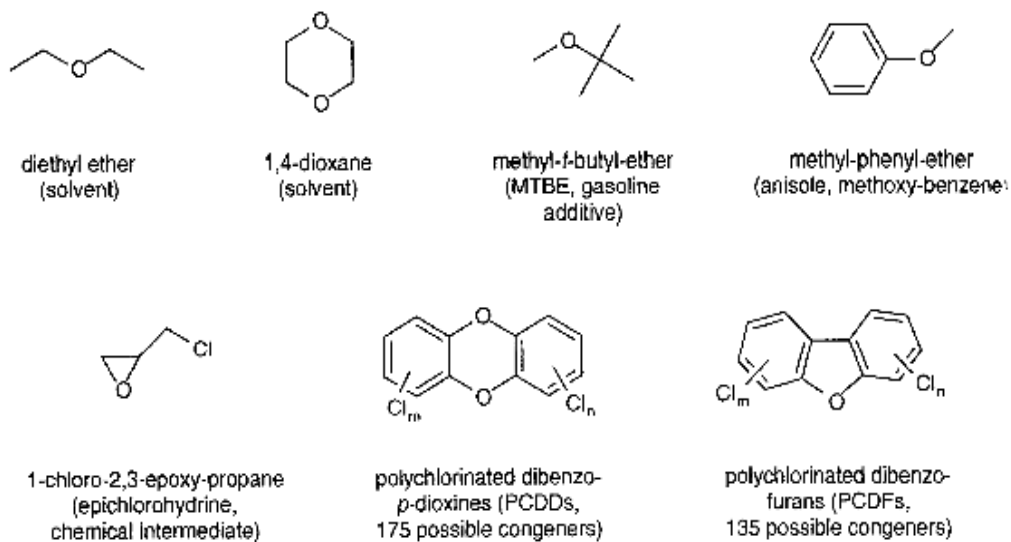
Some Examples of Polyhalogenated Hydrocarbons



Examples of Alcohols and Ethers



ethers (R_1-O-R_2)



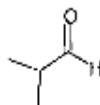
Examples of Ketones, Aldehydes, Esters and Carboxylic Acids



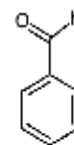
formaldehyde
(disinfectant,
chemical intermediate)



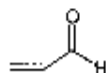
acetaldehyde
(chemical intermediate,
solvent)



isobutyraldehyde
(chemical intermediate,
solvent, disinfection
byproduct in drinking water)



benzaldehyde
(chemical intermediate,
solvent)



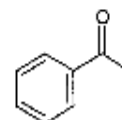
acrolein
(chemical intermediate
for polymer production)



acetone
(chemical intermediate,
solvent)



2-butanone
(solvent)

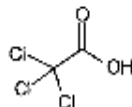


methyl phenylketone
(acetophenone; chemical
intermediate, solvent)

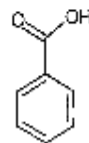
carboxyl ($R-C(=O)OH$) and carboxylic acid ester ($R_1-C(=O)OR_2$) functions



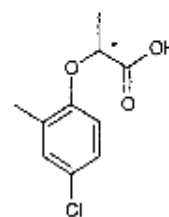
acetic acid



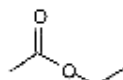
trichloroacetic acid
(herbicide, atmospheric
breakdown product of
chlorinated solvents)



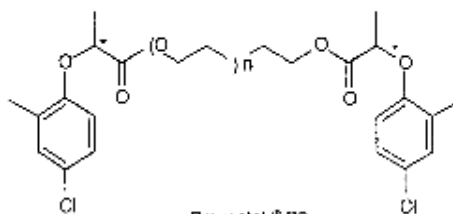
benzoic acid (food
preservative,
additive, chemical
intermediate)



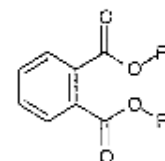
(R,S)-2-(4-chloro-2-methyl
phenyl) - propionic acid
([R,S]-mecoprop: herbicide)



ethyl acetate
(acetic acid ethyl
ester; solvent)

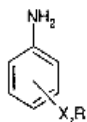


Preventol [®] B2
(root protection agent)

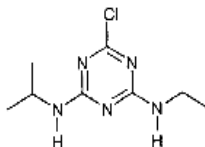


phthalates
($R_1, R_2 = C_1$ to C_{10} ;
plasticizers)

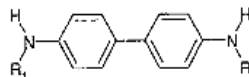
Examples containing Nitrogen Functionalities



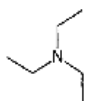
aniline and substituted anilines (chemical intermediates)



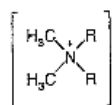
atrazine (a triazine herbicide)



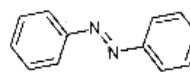
N,N'-dialkylaryl p-phenylenediamines (antioxidants)



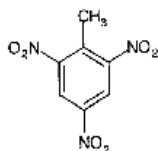
triethylamine (solvent, wetting agent, corrosion inhibitor, propellant)



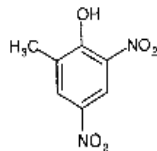
quaternary ammonium salts (cationic surfactants)



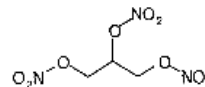
azobenzene (chemical intermediate, pesticide)



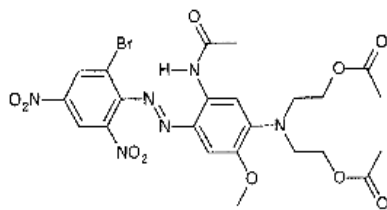
2,4,6-trinitrotoluene (TNT, explosive)



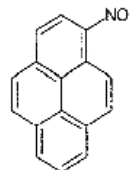
2,4-dinitro-*o*-cresol (DNOC, herbicide)



'nitroglycerin' (explosive)



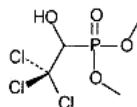
Dispersive Blue 79 (textile dye)



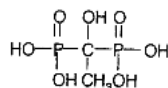
1-nitropyrene (airborne pollutant, fuel combustion product)

Examples containing Phosphorous Functionalities

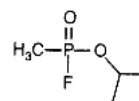
phosphonates



trichlorfon (insecticide)

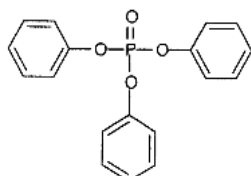


1-hydroxyethyl-1,1-diphosphonic acid (HEDP, complexing agent)

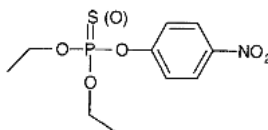


sarin (nerve poison)

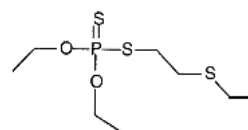
phosphates and thiophosphates



triphenylphosphate (plasticizer, fire retardant)



parathion (paraoxon) (insecticide, acaricide)



disulfoton (insecticide, acaricide)

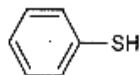
Examples containing Sulfur Functionalities



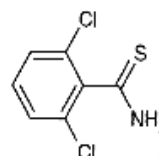
ethylmercaptan
(ethanethiol)
(odorant, chemical
intermediate)



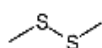
dimethylsulfide
(solvent, important
biogenic sources)



thiophenol
(chemical
intermediate)



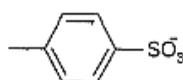
chlorthiamide
(herbicide)



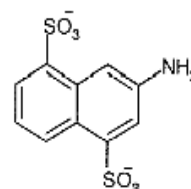
dimethyldisulfide
(important biogenic
source)



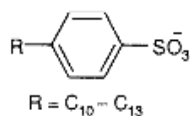
dimethylsulfoxide
(solvent)



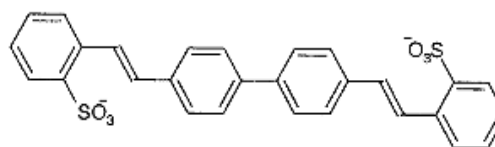
p-toluenesulfonate
(hardener, stabilizer)



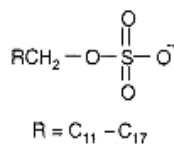
2-amino-naphthalene-4,8-disulfonate
(azo dye component)



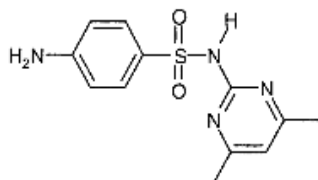
linear alkylbenzene
sulfonates (LAS)
(surfactants)



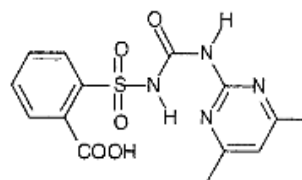
4,4'-bis(2-sulfostyryl)biphenyl
(DSBP, fluorescent whitening agent)



fatty alcohol sulfates (FAS)
(surfactants)



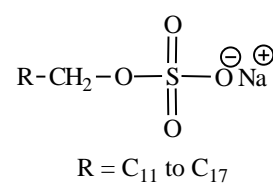
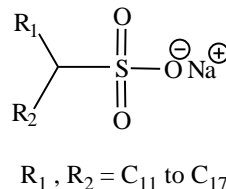
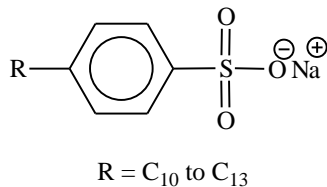
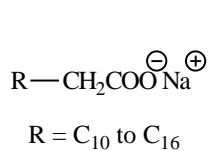
sulfadiazine
(a therapeutic drug)



sulfomethuron
(a "sulfonylurea" herbicide)

Examples of Some Commercially Important Surfactants

Anionic Surfactants

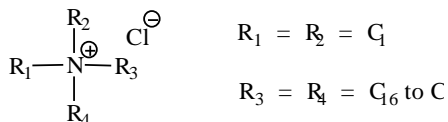


Soaps

Linear alkylbenzene sulfonates
(LAS)

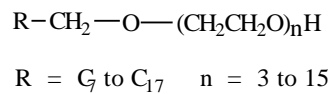
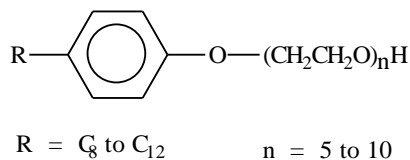
Secondary alkylsulfonates Fatty alcohol sulfates
(SAS) (alkyl sulfates, FAS)

Cationic Surfactants



Quaternary ammonium chloride (QAC)

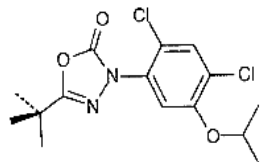
Nonionic Surfactants



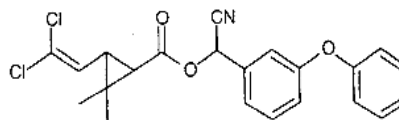
Alkylphenol polyethyleneglycol
(APEO)

Fatty alcohol polyethyleneglycol ethers
(AEO)

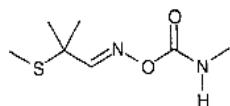
Examples of Complex Pesticides



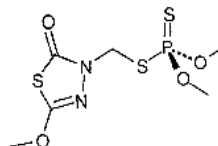
oxadiazon
(herbicide)



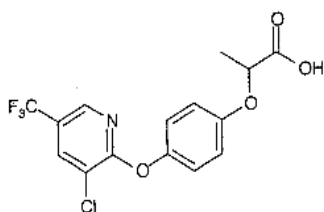
cypermethrin
(a pyrethroid insecticide;
mixtures of diastereomers)



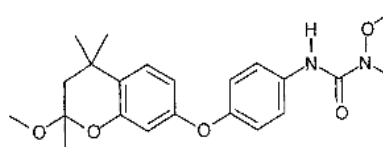
aldicarb
(insecticide, acaricide, nematocide)



methidathion
(insecticide, acaricide)

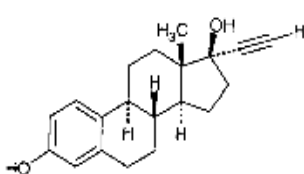


haloxyfop
(herbicide)

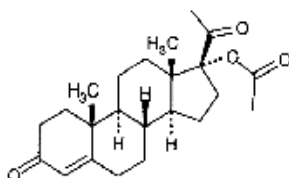


metobenzuron
(herbicide)

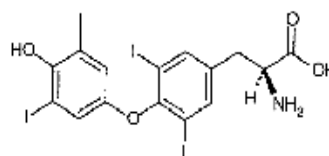
Examples of some complex Pharmaceutical Structures



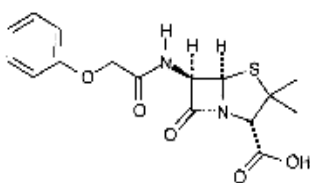
17-ethynyl estradiol
(hormone, birth control pill)



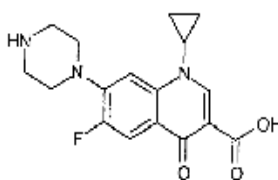
17α-acetoxy-progesterone
(hormone)



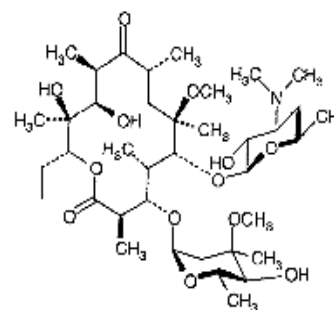
levothyroxine
(hormone)



penicillin V
(β-lactam antibiotic)



ciprofloxacin
(fluoroquinolone antibiotic)



clarithromycin
(macrolide antibiotic)

Examples of Endocrine Disrupting Compounds

