University of St Andrews

Carcinogens

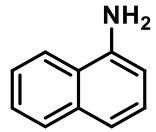
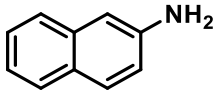
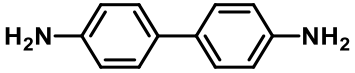
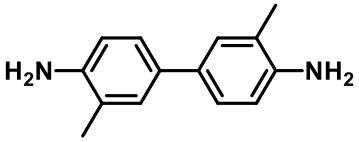
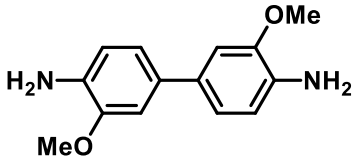
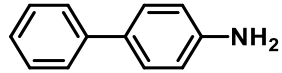
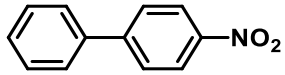
1. Introduction

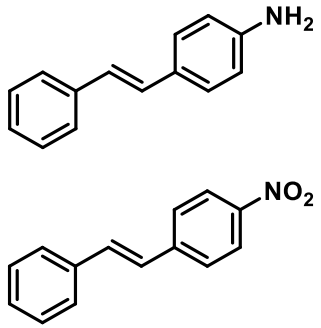
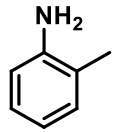
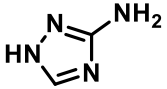
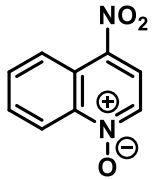
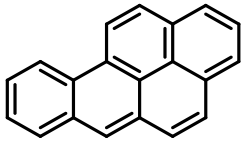
Carcinogenic reagents present a serious hazard since slight exposure, even on a single occasion, may result in serious irreversible effects producing cancer. In handling these compounds all possible steps must be taken to completely avoid contact with the body or release to the environment.

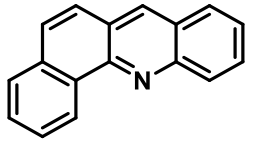
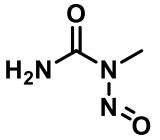
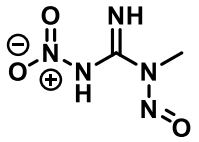
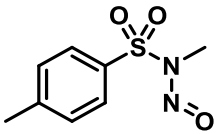
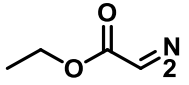
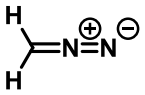
The majority of these materials have been classified as 5T, C in the CHARM system.

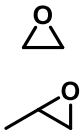
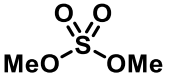
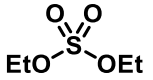
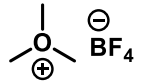
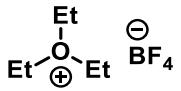
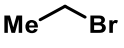
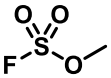
2. List of Common Carcinogenic Reagents

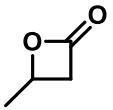
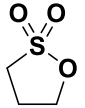
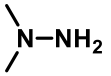
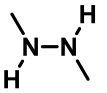
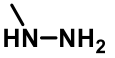
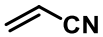
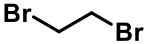
A list of common carcinogenic reagents can be found below.

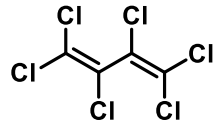
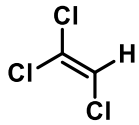
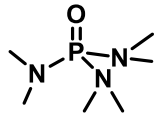
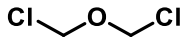
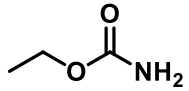
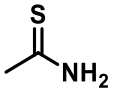
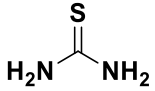
Chemical Name / General Description	CAS Numbers of Common Examples	Structure
Aromatic Nitrogen Compounds	α-Naphthylamine (134-32-7)	
	β-Naphthylamine (91-59-8)	
	Benzidines (e.g. 92-87-5)	
	Tolidines (e.g. 119-93-7)	
	Dianisidines (e.g. 119-90-4)	
	Aminobiphenyls (e.g. 92-67-1)	
	Nitrobiphenyls (e.g. 92-93-3)	

Aromatic Nitrogen Compounds	All amino and nitro stilbenes (e.g. 834-24-2, 1694-20-8)	
	o-Toluidine (95-53-4; LTEL 0.1 ppm)	
	3-Amino-1,2,4-triazole and related compounds (e.g. 61-82-5)	
	Nitroquinoline N-oxides and similar compounds (e.g. 56-57-5)	
Polycyclic aromatic hydrocarbons ("bay region" compounds)	Benzo[a]pyrene (50-32-8)	

Polycyclic aromatic hydrocarbons ("bay region" compounds)	Benzacridine and derivatives (e.g. 225-51-4)	
All N-nitroso compounds including	Nitrosamines (e.g. dimethylnitrosamine; 62-75-9)	
	Nitrosamides, e.g. diazomethane precursor N-methyl-N-nitrosourea (684-93-5)	
	N-Methyl-N-nitrosoguanidine (70-25-7)	
	N-Methyl-N-nitroso-p-toluenesulfonamide ("Diazald"; 80-11-5)	
Diazo-compounds	Ethyl diazoacetate (623-73-4)	
	Diazomethane (334-88-3)	

Alkylating agents	All epoxides and aziridines. Ethylene oxide and propylene oxide, both LTEL 1 ppm	
	Dimethyl sulfate (77-78-1)	
	Diethyl sulfate (LTEL 0.05 ppm; 64-67-5).	
	Trimethyloxonium fluoroborate (420-37-1; "Meerwein reagent")	
	Triethyloxonium fluoroborate (368-39-8; "Meerwein reagent")	
	Methyl iodide (74-88-4; LTEL 2 ppm)	
	Ethyl bromide (74-96-4)	
	Methyl fluorosulfonate ("Magic methyl"; 421-20-5) **The use of methyl fluorosulfonate IS PROHIBITED**	
Acylating agents	β-Propiolactone (57-57-8)	

Acylating agents	β-Butyrolactone (3068-88-0)	
	1,3-Propanesultone (1120-71-4)	
Hydrazines and simple derivatives	Hydrazine (302-01-2; LTEL 0.01 ppm)	H_2N-NH_2
	1,1-Dimethylhydrazine (57-14-7)	
	1,2-Dimethylhydrazine (540-73-8)	
	Methylhydrazine (60-34-4)	
Vinyl halides and derivatives	Vinyl chloride monomer (75-01-4; LTEL 1 ppm)	
	Vinyl bromide (593-60-2; LTEL 1 ppm)	
	Acrylonitrile (107-13-1; LTEL 2 ppm)	
Haloalkane solvents	Carbon tetrachloride (56-23-5; LTEL 1 ppm)	CCl_4
	Chloroform (67-66-3; LTEL 2 ppm)	$CHCl_3$
	1,2-Dibromoethane (106-93-4; LTEL 0.5 ppm)	

Haloalkane solvents	Hexachlorobutadiene (87-68-3)	
	Trichloroethylene (79-01-6)	
Miscellaneous compounds	Benzene (71-43-2; LTEL 1 ppm)	
	Hexamethylphosphoramide (680-31-9)	
Miscellaneous compounds	Chloromethyl methyl ether (107-30-2)	
	Bis(chloromethyl) ether (542-88-1; LTEL 0.001 ppm)	
	Ethyl carbamate / “urethane” (51-79-6)	
	Thioacetamide (62-55-5)	
	Thiourea (62-56-6)	

Transition Metals / Heavy metals	Arsenic	-
	Beryllium	-
	Cadmium	-
	Cobalt	-
	Nickel	-
	Chromium(VI) / chromic acid	-
	Nickel sulfide	-
	Lead chromates	-
	Zinc chromates	-
All Radiochemicals		
All Forms of Asbestos		