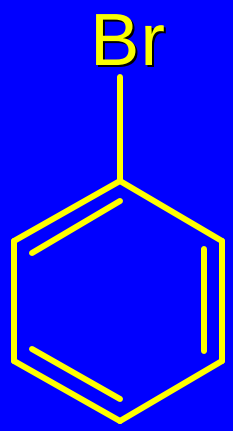
11.7
Substituted Derivatives of Benzene and Their Nomenclature

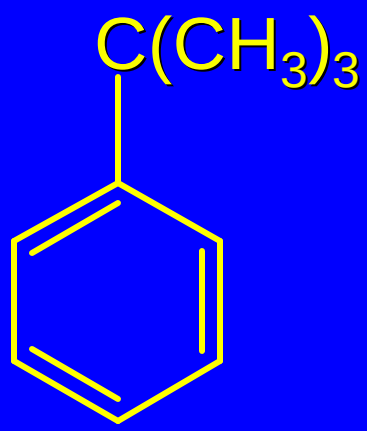
General Points

1) Benzene is considered as the parent and comes last in the name.

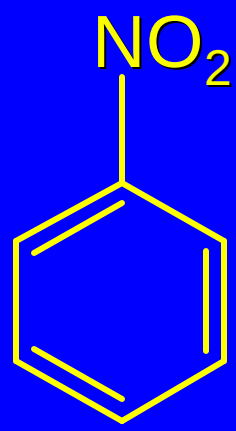
Examples



Bromobenzene



tert-Butylbenzene



Nitrobenzene

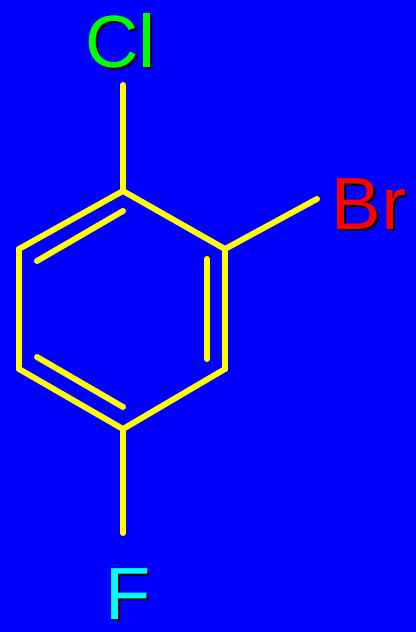
General Points

1) Benzene is considered as the parent and comes last in the name.

2) List substituents in alphabetical order

3) Number ring in direction that gives lowest locant at first point of difference

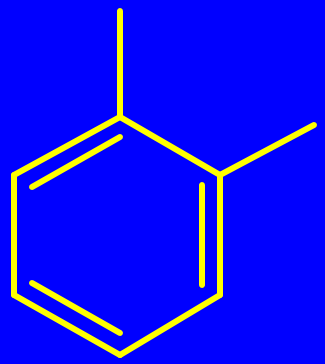
Example

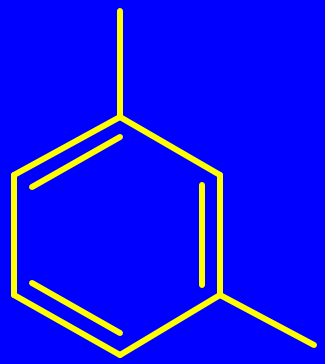


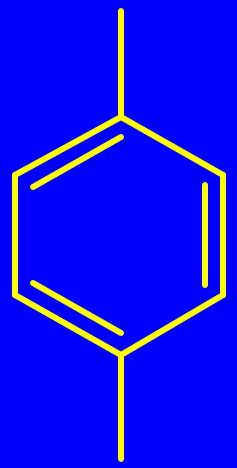
2-bromo-1-chloro-4-fluorobenzene

Ortho, Meta, and Para

alternative locants for disubstituted derivatives of benzene





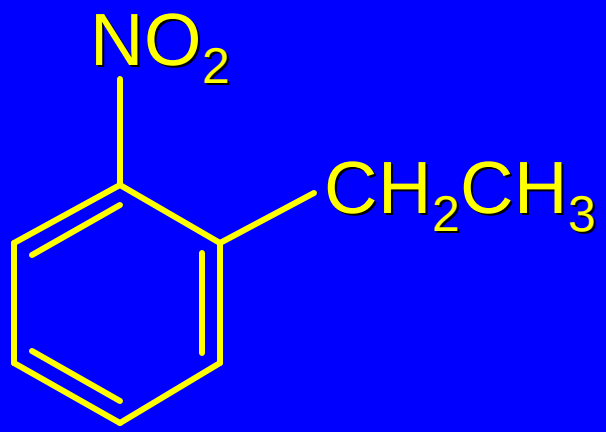


1,2 = ortho (abbreviated *o*-)

1,3 = meta (abbreviated *m*-)

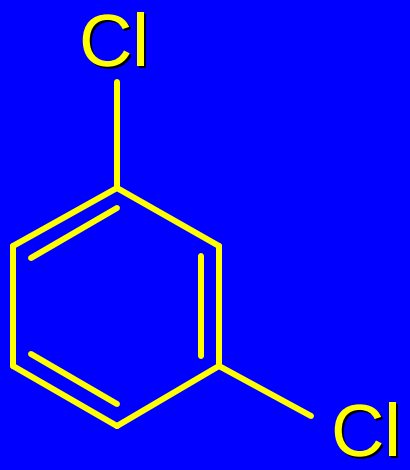
1,4 = para (abbreviated *p*-)

Examples



o-ethylnitrobenzene

(1-ethyl-2-nitrobenzene)



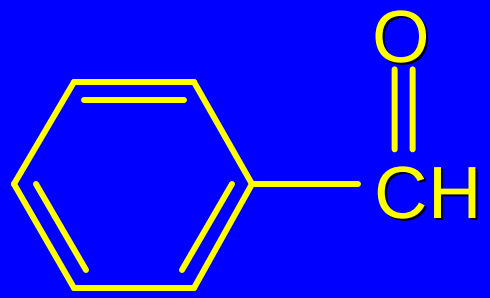
m-dichlorobenzene

(1,3-dichlorobenzene)

Table 11.1 (p 407)

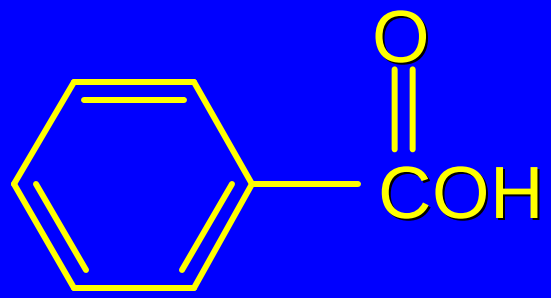
Certain monosubstituted derivatives of benzene have unique names

Table 11.1 (p 407)



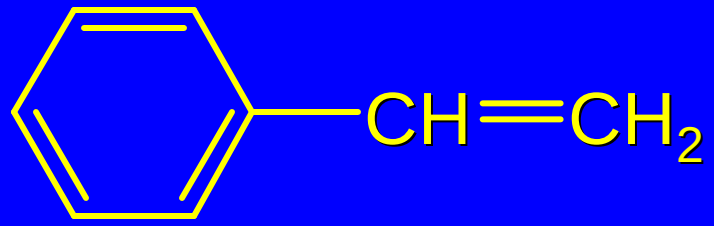
Benzaldehyde

Table 11.1 (p 407)



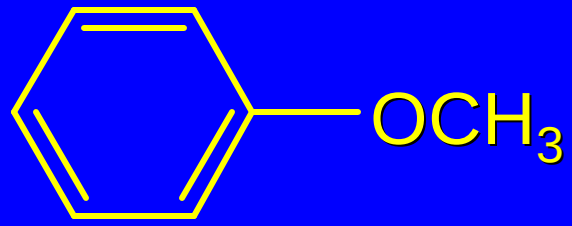
Benzoic acid

Table 11.1 (p 407)



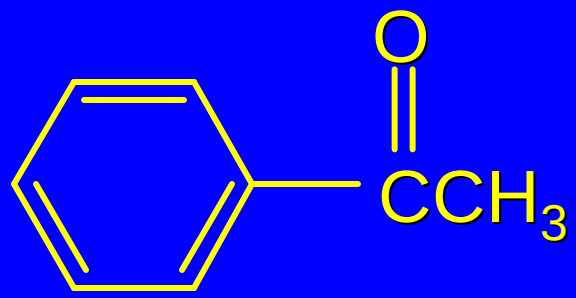
Styrene

Table 11.1 (p 407)



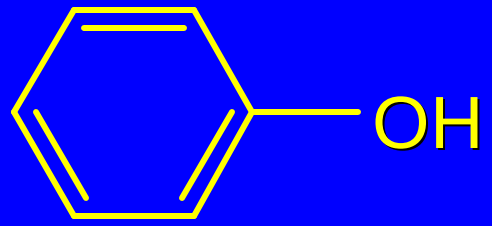
Anisole

Table 11.1 (p 407)



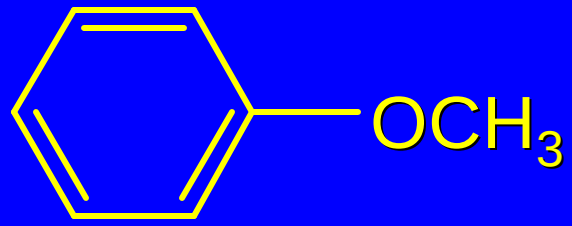
Acetophenone

Table 11.1 (p 407)



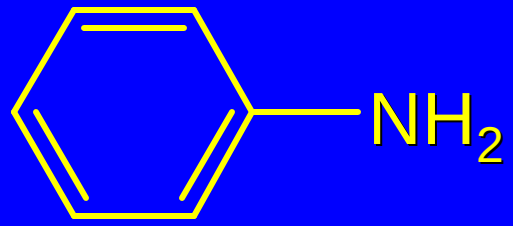
Phenol

Table 11.1 (p 407)



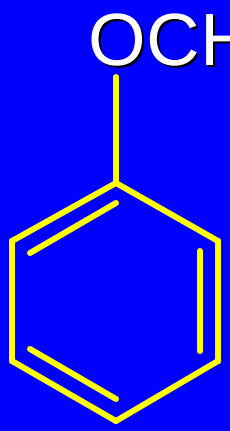
Anisole

Table 11.1 (p 407)

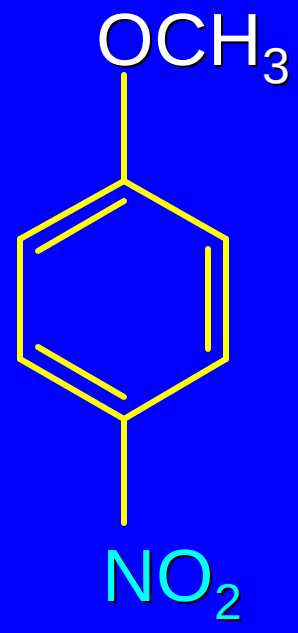


Aniline

Names in Table 11.1 can be used as parent



Anisole

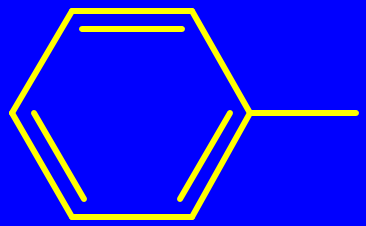


p-Nitroanisole

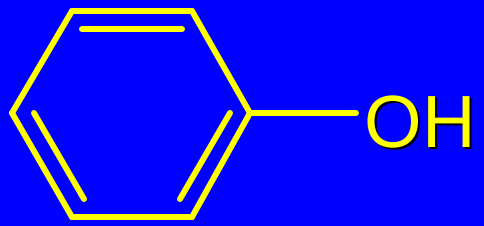
or

4-Nitroanisole

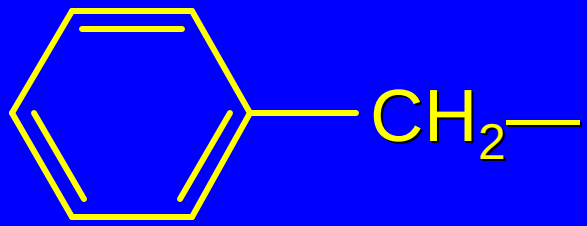
Easily confused names



phenyl



phenol

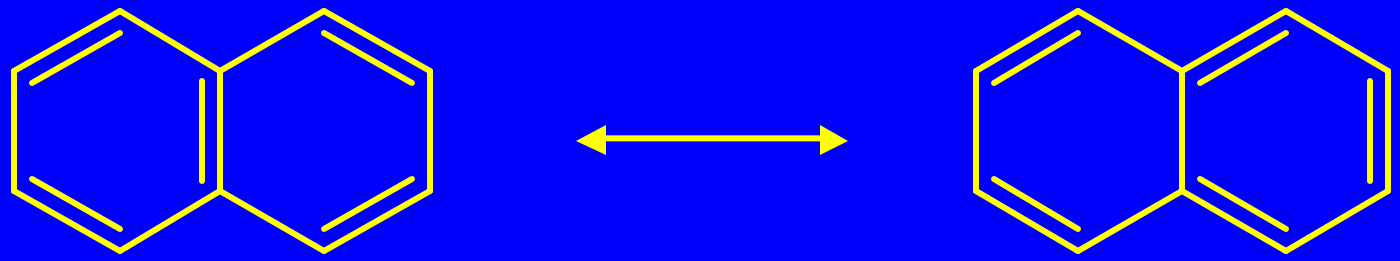


benzyl

11.8
Polycyclic Aromatic Hydrocarbons

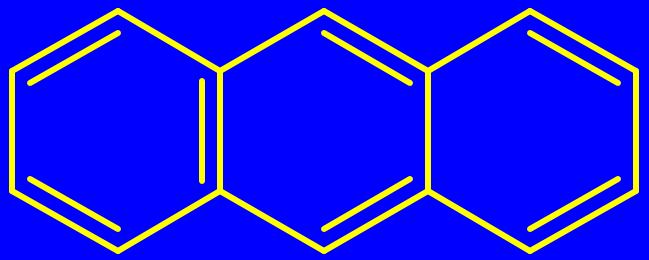
Naphthalene

resonance energy = 255 kJ/mol

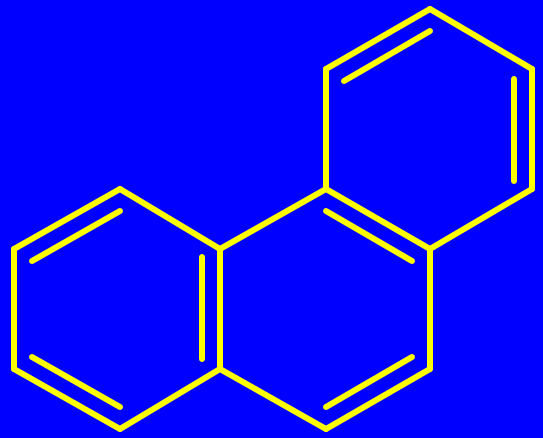


most stable Lewis structure;
both rings correspond to
Kekulé benzene

Anthracene and Phenanthrene



Anthracene



Phenanthrene

resonance energy:

347 kJ/mol

381 kJ/mol

11.9
Physical Properties of Arenes

Physical Properties

Resemble other hydrocarbons

- nonpolar
- insoluble in water
- less dense than water