

# **Ashford's** Dictionary of Industrial Chemicals

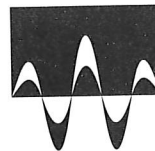
Properties

Production

Uses

Compiled by Robert D. Ashford

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## FLUOBORIC ACID

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*Production:*

- 2-amino-5-chloro-2'-fluorobenzophenone + dimethyl sulphate + chloroacetyl chloride + ammonia (methylation/dechlorination/amide formation/condensation/nitration)

*Uses:* hypnotic drug**fluoboric acid**

fluoroboric acid; tetrafluoroboric acid; [16872-11-0]



$\text{H}_1\text{B}_1\text{F}_4$ . M: 87.81. Colourless liquid. BP: 130°C with decomposition. Miscible with water forming strongly acidic solutions. Miscible with alcohol.

*Production:*

- boric acid + hydrofluoric acid (salt formation)

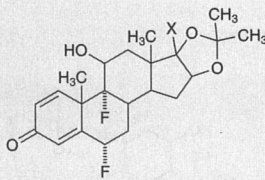
*Derivatives:*

ammonium fluoborate; copper fluoborate; ferrous fluoborate; nickel fluoborate; potassium fluoborate; sodium fluoborate; stannous fluoborate; zinc fluoborate

*Uses:* esterification/acetal formation catalyst; electroplating bath additive; etchant (semiconductor manufacture); hot-rolled steel pickling agent; azoic dye diazo component salts; aluminium surface treatment reagent

**fluocinonide**

[356-12-7]



X =  $-\text{COCH}_2\text{COOCH}_3$ ,  $\text{C}_{26}\text{H}_{32}\text{F}_2\text{O}_7$ . M: 494.54.

*Production:*

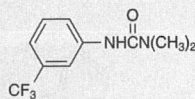
- cortisone (multistep synthesis)

*Uses:*

antiinflammatory drug

**fluometuron**

N-(3-trifluoromethylphenyl)-N',N'-dimethylurea; Cotoran (FMC); [2164-17-2]



$\text{C}_{10}\text{H}_{11}\text{F}_3\text{N}_2\text{O}_1$ . M: 232.20.

*Production:*

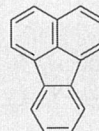
- m-aminobenzotrifluoride + dimethylcarbamoyl chloride (dehydrochlorination)

*Uses:*

herbicide

**fluoranthene**

1,2-benzacenaphthene; [206-44-0]



$\text{C}_{16}\text{H}_{10}$ . M: 202.26. Pale yellow crystals. MP: 111°C. BP: 375–385°C. d: 1.20 kg/l (0°C). Insoluble in water.

*Production:*

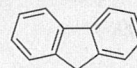
- anthracene oil (fractionation; byproduct of anthracene production)

*Uses:*

fluorescent dyestuffs intermediate

**fluorene**

[86-73-7]



$\text{C}_{13}\text{H}_{10}$ . M: 166.22. White flakes. MP: 112–115°C. BP: 295°C. Insoluble in water. Soluble in oxygenated and aromatic solvents.

*Production:*

- fluorene oil (fractionation; coproduced with acenaphthene/diphenylene oxide)

*Derivatives:* fluorenone**fluorene oil**

Narrow-cut, coal-tar fraction with a boiling range: 290–305°C.

*Production:*

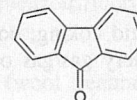
- coal tar, crude (alkali extraction/fractionation; coproduced with tar acid liquor/naphthalene fraction/anthracene oil/coal tar pitch/light oil/carbolic oil/creosote oil)

*Derivatives:*

acenaphthene; diphenylene oxide; fluorene

**fluorenone**

9-fluorenone; [486-25-9]



$\text{C}_{13}\text{H}_8\text{O}_1$ . M: 180.20. Solid. MP: 83°C. BP: 342°C. d: 1.13 kg/l (100°C). Insoluble in water. Soluble in oxygenated and aromatic solvents.

*Production:*

- fluorene (oxidation)

*Derivatives:* 2-methyl-3-phenylbenzyl alcohol; 2,4,7-trinitrofluorenone

*Uses:*

reagent (Oppenauer oxidation)

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**fluorescein**

uranine (disodium salt); Acid Yellow 73 (CI, sodium salt); Acid Yellow 73 (CI, free acid); 45350 (CI, free acid); D&C Yellow No. 8 (FDC, sodium salt); (sodium salt)



$\text{C}_{20}\text{H}_{12}\text{O}_5$ . M: 332.31. Poses when heated above 100°C in ethanol. Soluble in dilute solutions.

*Production:*

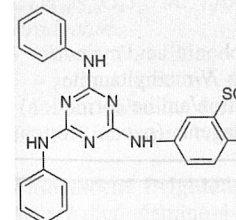
- resorcinol + phthalic anhydride (condensation/ether formation)

*Derivatives:* Acid Orange 10; Solvent Violet 10

*Uses:* acid dye (fluorescent); (cosmetics, medicine)

**Fluorescent Brightener**

4,4'-bis(4,6-dianilino-2-sulphonylphenyl)benzene sulphonate; Blankophor (Hickson and Welch);



$\text{C}_{44}\text{H}_{36}\text{N}_{12}\text{O}_6\text{S}_2$ . M: 892.2

*Production:*

- 4,4'-diaminostilbene + cyanuric chloride + sodium hydroxide (cyclization)

*Uses:* fluorescent brightener**Fluorescent Brightener**

Tinopal 2B (Ciba-Geigy); [17118-40-0] (cis-isomer)

