

at 179.26. C 73.70%, H of *l*-form from *Ephedra* and allied *Gnetaceae*; *Volles*, *Arch. Pharm.* 268, th, loc. cit.; of *d*-, *l*-, and mixture: Nagai, Kanao, *l*-. Pfanz, Müller, *Arch.*



or methanol, mp 63.5. vents.

Crystals from acetone.

$[\alpha]_D^{20} +29.2^\circ$  ( $c = 4$  in

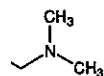
from ethyl acetate, mp

, mp 87-88°.  $[\alpha]_D -29.5^\circ$

s from ethyl acetate, or  $c = 4.6$ ). Readily sol in y sol in acetone.

*ephedrine camsylate*, Ty

**4-[2-(Dimethylamino)-1-[(dimethylamino)methyl]-4-dihydroxyphenyl]-2-di-oxo-3-phenyl-1-propanone**. *C<sub>22</sub>H<sub>28</sub>N<sub>2</sub>O<sub>5</sub>*; mol wt 424.50. C 66.63%, H 7.10%, N 12.38%. Prep: Manna, Campiglio, *Far* configuration: Manna, Gbis

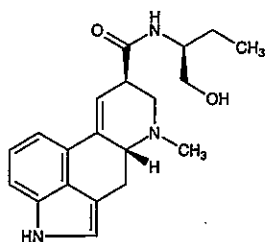


itals from alcohol + ethyl

hyl acetate, mp 149-150° (lit.).

50°.  $[\alpha]_D^{25} +62.3^\circ$  ( $c = 1.4$ ).

**8β(S)-9,10-Didehydro-N-[1-ergoline-8-carboxamide]-N-ergamine**. *C<sub>22</sub>H<sub>28</sub>N<sub>2</sub>O<sub>5</sub>*; mol wt 424.50. C 66.63%, H 7.10%, N 12.38%. Prep: Manna, Campiglio, *Far* configuration: Manna, Gbis



Shiny crystals from benzene, mp 172° (some decompn).  $[\alpha]_D^{20} -45^\circ$  ( $c = 0.4$  in pyridine). Sparingly sol in water. Freely sol in alcohol, acetone.

Maleate, *C<sub>20</sub>H<sub>25</sub>N<sub>3</sub>O<sub>2</sub>·C<sub>4</sub>H<sub>4</sub>O<sub>4</sub>*, *Basofortina*, *Methergin*, *Methergine*, *Metenarin*, *Methylergobrevin*, *Ryegonovin*, *Spametrin-M*. White to pinkish-tan microcryst powder; odorless; bitter taste. Slightly sol in water, alcohol; very slightly sol in chloroform, ether.

Tartrate, *(C<sub>20</sub>H<sub>25</sub>N<sub>3</sub>O<sub>2</sub>)<sub>2</sub>·C<sub>4</sub>H<sub>4</sub>O<sub>6</sub>*, clusters of needles, usually with 2 mols of methanol of crystn. Easily sol in water, alcohol, very slightly sol in ether, chloroform. pH of aq solns 5.0-5.8.

Therap CAT: Oxytocic.

**6148. Methyl Ether.** *Oxybismethane*; dimethyl ether. *C<sub>2</sub>H<sub>6</sub>O*; mol wt 46.07. C 52.14%, H 13.13%, O 34.73%. *CH<sub>3</sub>OCH<sub>3</sub>*. Prep: J. Dumas, E. Peligot, *Ann.* 15, 1 (1835); and thermal properties: R. M. Kennedy *et al.*, *J. Am. Chem. Soc.* 63, 2267 (1941). Atmospheric chemistry: S. M. Japar *et al.*, *Int. J. Chem. Kinet.* 22, 1257 (1990). Review: H. Höver in *Ullmann's Encyclopedia of Industrial Chemistry* vol. A8 (VCH, Weinheim, 1987) pp 541-544; of use in diesel engines: A. M. Rouhi, *Chem. Eng. News* 73, 37-39 (May 29, 1995).

Colorless, flammable gas with a slight ethereal odor. mp -141.50°. bp -24.82°.  $d_4^{25}$  (1 atm) 1.91855 g/l. Heat capacity at 210.51°K: 23.88 cal/deg/mole. Heat of vaporization at bp: 5141.0 cal/mole. Heat of fusion: 1179.8 cal/mole. Flash pt -41°. One vol water takes up 37 vols gas.

USE: Aerosol propellant; alternative diesel fuel; chemical intermediate.

**6149. Methyl Ethyl Ketone.** *2-Butanone*; ethyl methyl ketone; MEK; 2-oxobutane. *C<sub>4</sub>H<sub>8</sub>O*; mol wt 72.11. C 66.63%, H 11.18%, O 22.19%. *CH<sub>3</sub>COCH<sub>2</sub>CH<sub>3</sub>*. Prep from ethyl 2-methylacetoacetate: J. Schramm, *Ann.* 398, 242 (1913). Manuf by dehydration of 2-butanol and by catalytic oxidation of *n*-butenes: A. J. Papa, P. D. Sherman, Jr. in *Kirk-Othmer Encyclopedia of Chemical Technology* vol. 13 (Wiley-Interscience, New York, 3rd ed., 1981) pp 903-907. Toxicity: H. F. Smyth *et al.*, *Am. Ind. Hyg. Assoc. J.* 23, 95 (1962).

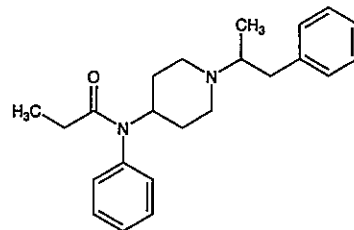
Flammable liquid; acetone-like odor.  $d_4^{20}$  0.805. mp -86°. bp 79.6°. Flash pt, closed cup: 21°F (-6°C).  $n_D^{20}$  1.3814. Sol in ~4 parts water (27.5%); less sol at higher temp; miscible with alcohol, ether, benzene. Constant boiling mixture with water, bp 73.4°, contains 88.7% methyl ethyl ketone. Soly of water in methyl ethyl ketone: 12.5% at 25°. LD<sub>50</sub> orally in rats: 6.86 ml/kg (Smyth).

Caution: Potential symptoms of overexposure are irritation of eyes and nose; headache; dizziness; vomiting. See *NIOSH Pocket Guide to Chemical Hazards* (DHHS/NIOSH 90-117, 1990) p 48.

USE: As solvent; in the surface coating industry; manuf smokeless powder; colorless synthetic resins.

**6150. α-Methylfentanyl.** *N*-[1-(1-Methyl-2-phenylethyl)-4-piperidinyl]-*N*-phenylpropanamide; *N*-[1-(α-methylphenyl)-4-piperidyl]propionanilide; 1-(1-methyl-2-phenylethyl)-4-(*N*-propanilido)piperidine. *C<sub>23</sub>H<sub>30</sub>N<sub>2</sub>O*; mol wt 350.50. C 78.82%, H 8.63%, N 7.99%, O 4.56%. Potent derivative of fentanyl, q.v. Prep: P. A. J. Janssen, *Fr. pat.* M2430; *idem*, U.S. pat. 3,164,600 (1964, 1965 both to Janssen). This substance has erroneously been referred to as "China White", the street term for very pure Southeast Asian heroin. Initial identification of "China White" as α-methyl-

fentanyl: T. C. Kram *et al.*, *Anal. Chem.* 53, 1379 A (1981). Molecular structure determ using tandem mass spectrometry: M. T. Cheng *et al.*, *ibid.* 54, 2204 (1982). Identification and quantification in tissue: T. J. Gillespie *et al.*, *J. Anal. Toxicol.* 6, 139 (1982). Confirmation of identity of "China White": S. Suzuki *et al.*, *Chem. Pharm. Bull.* 34, 1340 (1986). Immunoassay for detection of use in racehorses: J. McDonald *et al.*, *Res. Commun. Chem. Pathol. Pharmacol.* 57, 389 (1987).



Hydrochloride, *C<sub>23</sub>H<sub>30</sub>N<sub>2</sub>O·HCl*, crystals from isopropanol, mp 272.8-273.6°.

Note: This is a controlled substance (opiate) listed in the U.S. Code of Federal Regulations, Title 21 Part 1308.11 (1995).

**6151. Methyl Fluorosulfonate.** *Fluorosulfuric acid methyl ester*; methyl fluorosulfate; methyl fluosulfonate; Magic Methyl. *CH<sub>3</sub>FO<sub>3</sub>S*; mol wt 114.10. C 10.53%, H 2.65%, F 16.65%, O 42.07%, S 28.10%. *CH<sub>3</sub>OSO<sub>2</sub>F*. Prep from dimethyl ether and fluosulfonic acid: J. Meyer, G. Schramm, *Z. Anorg. Allgem. Chem.* 206, 24 (1932); from dimethyl sulfate and fluosulfonic acid: R. W. Alder, *Chem. & Ind. (London)* 1973, 983. Electrochemical prep: J. P. Coleman, D. Pletcher, *Tetrahedron Letters* 1974, 147. Powerful methylating agent: M. G. Ahmed *et al.*, *Chem. Commun.* 1968, 1533. Human toxicity: D. M. W. vanden Ham, D. van der Meer, *Chem. & Eng. News* 54, 5 (Aug. 30, 1976); *idem*, *Chem. & Ind. (London)* 1976, 782. Toxicity study: M. Hite *et al.*, *Am. Ind. Hyg. Assoc. J.* 40, 600 (1979).

Volatile liq, bp 92-94°, mp -95°. *Severe Poison!*  $d_4^{20}$  1.3326. Good solvent for most organic compounds. Proton NMR absorption at tau 5.88. LD<sub>50</sub> orally in mice: <112 mg/kg; LC<sub>50</sub> 1 hr for rats: 5-6 ppm (Hite).

Caution: Extremely toxic to humans. (vanden Ham, van der Meer). Exposure can cause fatal pulmonary edema.

USE: In organic synthesis as methylating agent.

**6152. N-Methylformamide.** *N*-Monomethylformamide; NMF; MMF; NSC-3051. *C<sub>2</sub>H<sub>5</sub>NO*; mol wt 59.07. C 40.67%, H 8.53%, N 23.71%, O 27.09%. *HCONHCH<sub>3</sub>*. Prep: A. Gautier, *Ann.* 151, 239 (1869); G. F. D'Alelio, E. E. Reid, *J. Am. Chem. Soc.* 59, 109 (1937); J. A. Marsella, G. P. Pez, *J. Mol. Catal.* 35, 65 (1986); J. J. Cappon *et al.*, *Recl. Trav. Chim. Pays-Bas* 113, 318 (1994). Dielectric spectrum: J. Barthel *et al.*, *Chem. Phys. Letters* 167, 62 (1990). Toxicology: S. P. Langdon *et al.*, *Toxicology* 34, 173 (1985). Review of metabolism, toxicity, and pharmacology: G. L. Kennedy, Jr., *Crit. Rev. Toxicol.* 17, 129-182 (1986). Review of antitumor activity and clinical evaluation: K. Clagett-Carr *et al.*, *J. Clin. Oncol.* 6, 906-918 (1988).

mp -5.4°. bp 180-185°. bp<sub>0</sub> 131°.  $d_4^{25}$  0.9961. Sol in acetone, alcohol, water. LD<sub>50</sub> in mice (mg/kg): 2300 i.p.; 2600 orally; 1580 i.v.; 2700 i.m. (Langdon).

USE: Solvent.

**6153. Methyl Formate.** *Formic acid methyl ester.* *C<sub>2</sub>H<sub>4</sub>O<sub>2</sub>*; mol wt 60.05. C 40.00%, H 6.71%, O 53.28%. *HCOOCH<sub>3</sub>*.

Colorless flammable liquid, agreeable odor.  $d_4^{25}$  0.987. bp 31.5°.  $n_D^{20}$  1.3440. Flash pt, closed cup: -2°F (-19°C). mp ~-100°. Sol in about 3.3 parts water; miscible with alcohol.

Caution: Potential symptoms of overexposure are eye and nose irritation; chest oppression, dyspnea; visual disturbance; CNS depression. See *NIOSH Pocket Guide to Chemical Hazards* (DHHS/NIOSH 90-117, 1990) p 150. See also *Patty's Industrial Hygiene and Toxicology* vol. 2A, G. D.