58922

(2)

THE MERCK INDEX

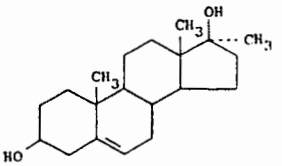
AN ENCYCLOPEDIA OF
CHEMICALS, DRUGS, AND BIOLOGICALS

ELEVENTH EDITION

Susan Budavari, *Editor*
Maryadele J. O'Neil, *Associate Editor*
Ann Smith, *Assistant Editor*
Patricia E. Heckelman, *Editorial Assistant*

Published by
MERCK & CO., INC.
RAHWAY, N.J., U.S.A.

1989



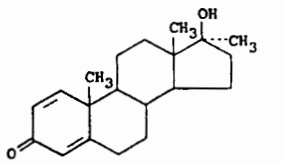
Crystals from ethyl acetate, mp 205.5-206.5°. $[\alpha]_D^{20}$ −73° (alc). Insol in water. Slightly sol in some organic solvents.

Diacetate, $C_{24}H_{36}O_4$, crystals from hexane, mp 145-146°. $[\alpha]_D^{23}$ −59° (c = 0.984 in alc).

Dipropionate, $C_{26}H_{40}O_4$, *Probolin.*

THERAP CAT: Anabolic.

5862. Methandrostenolone. *17-Hydroxy-17-methylandrosta-1,4-dien-3-one;* 17α-methyl-17β-hydroxyandrosta-1,4-dien-3-one; 1-dehydro-17α-methyltestosterone; methandienone; Danabol; Nerobol; Nabolin; Stenolon; Dianabol. $C_{20}H_{28}O_2$; mol wt 300.42. C 79.95%, H 9.39%, O 10.65%. Anabolic steroid. Prepn by microbial dehydrogenation of 17α-methyltestosterone: Vischer *et al., Helv. Chim. Acta* **38,** 1502 (1955); by reduction of 17α-methyltestosterone with selenium dioxide: Meystre *et al., ibid.* **39,** 734 (1956); Wettstein *et al.,* U.S. pat. 2,900,398 (1959 to Ciba).



Crystals from acetone + ether. mp 163-164°. $[\alpha]_D^{26}$ 0° (c = 1.15 in chloroform). uv max: 245 nm (ε 15600).

THERAP CAT: Androgen.

THERAP CAT (VET): Anabolic.

5863. Methane. Marsh gas; methyl hydride. CH_4; mol wt 16.04. C 74.87%, H 25.13%. Widely distributed in nature. American natural gas is about 85% methane. The earth's atm contains 0.00022% by vol. Major constituent of the atm of the outer planets (Jupiter, Saturn, Uranus, Neptune), exact figures in *Landolt-Börnstein,* **vol. III** (Springer, 6th ed., 1952) p 59; G. P. Kuiper, *The Atmospheres of the Earth and the Planets* (University of Chicago Press, 1949). Pure carbon combines directly with pure hydrogen at temperatures above 1100° forming methane. Above 1500° amount of methane formed increases with temperature: Pring, *J. Chem. Soc.* **97,** 498 (1910). Can be prepd from sodium acetate and sodium hydroxide, or from aluminum carbide and water: Matthews, *J. Am. Chem. Soc.* **21,** 647 (1899); Carroll, *J. Phys. Chem.* **22,** 148 (1918). Prepd commercially from natural gas or by fermentation of cellulose and sewage sludge: Cost, U.S. pat. 2,583,090 (1952 to Elliott Co.); Le Paige, de Dommartin, Fr. pat. 994,032 (1951), *C.A.* **51,** 10836i (1957); Oswald, Golueke, *Mech. Eng.* **86,** 40 (1964).

Colorless, odorless, non-poisonous, flammable gas. Burns with a pale, faintly luminous flame. d_4^0 0.554 (air = 1) or 0.7168 g/liter. mp −182.6°. bp −161.4°. Crit temp −82.25°; crit pressure 45.8 atm. Heat of combustion 978 Btu/cu ft at 25° (a kilogram of CH_4 yields 13,300 kcal). Forms exposive mixtures with air, the loudest explosions occur when one vol of methane is mixed with 10 vols of air (or 2 vols of oxygen). Air contg less than 5.53% methane no longer explodes. Air contg more than 14% methane burns without noise. Autoignition temp 650°. Soly in water at 17°: 3.5 ml/100 ml H_2O. Sol in alc, ether, other organic solvents.

USE: Constituent of illuminating and cooking gas, in the manuf of hydrogen, hydrogen cyanide, ammonia, acetylene, formaldehyde, in organic syntheses. *Caution:* Simple asphyxiant.

5864. Methanearsonic Acid. *Methylarsonic acid;* methylarsinic acid; monomethylarsinic acid. CH_5AsO_3; mol wt 139.96. C 8.58%, H 3.60%, As 53.53%, O 34.30%. $CH_3AsO(OH)_2$. Prepd from sodium arsenite and methyl iodide: Quick, Adams, *J. Am. Chem. Soc.* **44,** 809 (192[illegible] sodium salt is easily prepd by treating sodium [illegible] dimethyl sulfate at 85°: Uhlinger, Cook, *Ind. Eng.* [illegible] 105 (1919). Other routes are by the reaction of [illegible] ride with sodium arsonate under pressure: Miller [illegible] pat. 2,442,372 (1948); by the reaction of dimet[illegible] with a solution of arsenic trioxide in sodium [illegible] Schwerdle, U.S. pat. 2,889,347 (1959). Acute tox[illegible] Gaines, R. E. Linder, *Fundam. Appl. Toxicol.* **7,** [illegible]

Monoclinic, spear-shaped plates from abs alco[illegible] ant acid taste. mp 161°. Strong dibasic acid. Pr[illegible] water; sol in alcohol.

Monosodium salt, CH_4AsNaO_3, *monosodium [illegible] sonate, MSMA, Ansar 170, Ansar 529, Bueno, [illegible] Trans-vert, Weed-E-Rad 120, Weed Hoc.* LD_{50} in ad[illegible] female rats (mg/kg): 1105, 1059 orally (Gaines, [illegible]

Disodium salt, $CH_3AsNa_2O_3$, *disodium monom[illegible] sonate, DSMA, Ansar 184, Ansar 8100, Arrhenal, [illegible] Arsynal, Cacodyl New, Clout, Crab-E-Rad, Del[illegible] Granular, Neo-Arsycodile, Sodar, Stenosine, Tonarsin, E-Rad 360, Weedone Crabgrass Killer Granular.* H[illegible] crystals contg $5H_2O$ or $6H_2O$. One gram dissolves [illegible] one ml water; slightly sol in alcohol. LD_{50} in ad[illegible] female rats (mg/kg): 928, 821 orally (Gaines, [illegible] Disodium methylarsonate combined with an eq[illegible] amount of mercury salicylate is called *Enesol;* white [illegible] sol in water.

USE: Herbicide.

5865. Methanesulfonic Acid. Methylsulfonic acid. [illegible] O_3S; mol wt 96.10. C 12.50%, H 4.19%, O 49.9[illegible] 33.37%. CH_3SO_2OH. Prepd from sulfur trioxide and [illegible] ane: Snyder, Grosse, U.S. pat. 2,493,038 (1950 to R[illegible] Process); by oxidation of dimethyl disulfide: Jo[illegible] Wolff, U.S. pat. 2,697,722 (1954 to Standard Oil of [illegible] ana); Proell *et al., Ind. Eng. Chem.* **40,** 1129 (1948); [illegible] prepns and chemistry: Suter, *The Organic Chemi[illegible] Sulfur* (Wiley, New York, 1944).

Solid. d_4^{18} 1.4812. mp 20°. bp_{10} 167°; bp_1 122°. [illegible] 26-28° in wt %: hexane, 0; methylcyclopentane, 0; b[illegible] 1.50; toluene, 0.38; *o*-chlorotoluene, 0.23; ethyl di[illegible] 0.47. Thermally stable at moderately elevated temp[illegible] hydrolyzed by boiling water or hot aq alkali. Corro[illegible] iron, steel, brass, copper, lead.

Ethyl ester *see* Ethyl Methanesulfonate.

Methyl ester *see* Methyl Methanesulfonate.

USE: As catalyst in polymerization, alkylation a[illegible] fication reactions; as a solvent. *Caution:* Strong

5866. Methanesulfonyl Chloride. CH_3ClO_2S; m[illegible] 114.55. C 10.48%, H 2.64%, Cl 30.95%, O 27.9[illegible] 27.99%. CH_3SO_2Cl. Prepd from methanesulfonic acid [illegible] thionyl chloride: Hearst, Noller, *Org. Syn.,* coll. vol. IV [illegible] (1963).

Liquid. d_4^{18} 1.4805. bp_{730} 161°; bp_{18} 62°. n_D^{25} 1.451.[illegible] tically insol in water; sol in alcohol, ether.

5867. Methanethiol. Methyl mercaptan; mercapto[illegible] ane; thiomethyl alcohol; methyl sulfhydrate. CH_4S; m[illegible] 48.11. C 24.96%, H 8.38%, S 66.65%. CH_3SH. Occ[illegible] "sour" gas of W. Texas, in coal tar, and in petroleum [illegible] lates. Isolated from roots of *Raphanus sativus.* Produc[illegible] the intestinal tract by the action of anaerobic b[illegible] on albumin. Evolved from *Penicillium brevicaule* [illegible] cultures containing disulfides. Prepn from sodium m[illegible] sulfate and KHS: Klason, *Ber.* **20,** 3409 (1887); Arndt, [illegible] **54,** 2236 (1921); catalytically from methanol and hydr[illegible] sulfide: Kramer, Reid, *J. Am. Chem. Soc.* **43,** 880 (1[illegible] from methyl chloride and sodium hydrosulfide: Scott [illegible] *Ind. Eng. Chem.* **47,** 876 (1955). Toxicity data: *Han[illegible] of Toxicology* **vol. 1,** W. S. Spector, Ed. (Saunders, Phil[illegible] phia, 1956) pp 344-345. Review on occurrence, prepar[illegible] properties and reactions: E. E. Reid, *Organic Chemis[illegible] Bivalent Sulfur* **vol. I** (Chemical Publishing Co., New [illegible] 1958) pp 15-261.

Flammable gas; odor of rotten cabbage. mp −123°. [illegible] 5.95°; d_4^{20} 0.8665; d_4^{25} 0.9600. Critical temp 196.8°. Cri[illegible] pressure 71.4 atm. Heat capacity (solid at 14.97-146.57 [illegible] 0.773-17.47 cal/deg/mole; (liq at 154.16-271.06°K): 21.[illegible] 21.13 cal/deg/mole, Russell *et al., J. Am. Chem. Soc.* 64 [illegible] (1942). Azeotrope with isobutane (14.9% methanethiol