pound with the arrangement acce is possible, in the second case *two* different substances may arise.

We wish to thank cand. real. A. Munthe-Kaas for his valuable assistance in carrying out dipole moment measurements.

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Derivatives of β-10-Phenothiazinepropionic Acid

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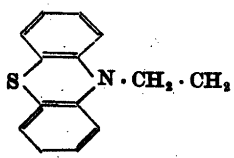
Previous investigations in this Laboratory have shown that certain derivatives of phenothiazine-10-carboxylic acid containing basic substituents possess strong spasmolytic and nicotinolytic properties [1]. As an extension of this work some new derivatives of the easily accessible β-10-phenothiazinepropionic acid were prepared (I—VI).



I. R = Cl
II. R = N⟨ ⟩
III. R = O—CH_2—CH_2—$N(CH_3)_2$
IV. R = O—CH_2—CH_2—$N(C_2H_5)_2$
V. R = S—CH_2—CH_2—$N(C_2H_5)_2$
VI. R = NH—CH_2—CH_2—$N(C_2H_5)_2$

The esters and amides were obtained *via* the acid chloride (I). The compounds III—VI were tested for cholinolytic and antihistaminic effect but their activity was rather weak.

Experimental. β-10-Phenothiazinepropionyl chloride (I). A mixture of β-10-phenothiazinepropionic acid [2] (5.42 g, 0.02 mole), pyridine (1.58 g, 0.02 mole), and ether (60 ml) was cooled to —5° and thionyl chloride (2.38 g, 0.02 mole) was added drop by drop with stirring. The mixture was kept at room temperature overnight. The separated pyridine hydrochloride was then filtered off and the ether was evaporated *in vacuo*. The residue (5.4 g, 93 %) was recrystallised twice from ether; m. p. 117—119°. (Found: C 62.6; H 3.97; Cl 12.0. $C_{15}H_{12}ClNOS$ requires C 62.2; H 4.18; Cl 12.2 %).

N-(β-10-Phenothiazinepropionyl)-piperidine (II). The acid chloride obtained above (1.45 g) was dissolved in ether (15 ml) and treated with piperidine (1.1 g) at room temperature. The mixture was filtered and the filtrate washed with water and evaporated to dryness. The residue (0.9 g, 53 %) was recrystallised from ethanol; m. p. 127—128°. (Found: C 70.4; H 6.23; N 8.09. $C_{20}H_{22}N_2OS$ requires C 70.9; H 6.55; N 8.28 %).

β'-Dimethylaminoethyl β-10-phenothiazinepropionate (III). A solution of I (2.9 g, 0.01 mole) and β-dimethylaminoethanol (2.2 g, 0.025 mole) in toluene (25 ml) was refluxed for two hours. After cooling the mixture was filtered and the filtrate washed with water and extracted with 2 *N* hydrochloric acid. The extract was made alkaline with sodium carbonate solution and the oily base extracted with ether. The ether was then evaporated giving a solid residue (2.0 g, 60 %) which melted at 81—83° after recrystallisation from ether. (Found: C 66.5; H 6.46; N 8.14. $C_{19}H_{22}N_2O_2S$ requires C 66.6; H 6.48; N 8.18%).

β'-Diethylaminoethyl β-10-phenothiazinepropionate oxalate (IV). Prepared by the same method as III. The oily base was isolated as the oxalate. Yield 55 %; m. p. 118—120° (from acetone). (Found: C 59.8; H 6.21. $C_{23}H_{28}N_2O_6S$ requires C 60.0; H 6.13 %).

β'-Diethylaminoethyl β-10-phenothiazinethiopropionate oxalate (V). Prepared from I and β-diethylaminoethyl mercaptan [3]. Yield 89 %; m. p. 121—122° (dec.) after recrystallisation from ethyl acetate. (Found: C 58.5; H 6.08; N 5.84. $C_{23}H_{28}N_2O_5S_2$ requires C 58.0; H 5.92; N 5.88 %).

N-(β-10-Phenothiazinepropionyl)-N^1,N^1-diethylethylenediamine oxalate (VI). Prepared from I and N,N-diethylethylenediamine [4] by the same method as for the esters. Yield 87 %; m. p. 130—131° (from acetone). (Found: C 59.8; H 6.14; N 8.78. $C_{23}H_{29}N_3O_5S$ requires C 60.1; H 6.36; N 9.14 %).

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