

NOTE ON GELSEMICINE*

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In 1931, the writer [1931] reported the isolation of a new alkaloid gelsemicine from the rhizome and roots of American gelsemium. It has the composition of $C_{20}H_{24}O_4N_2$ (not $C_{20}H_{25}O_4N_2$ as reported in 1931), a melting point of $171^\circ C$ and a specific rotation of -140° . Its mode of action has been studied by Hou [1931, 1932], Chen, Anderson and Robbins [1938], and Chen and Chou [1939], gelsemicine hydrochloride being used in all experiments. More recently, Forsyth, Marrian and Stevens [1945] isolated gelsemicine from Merck's "Nebenhydrochloride", confirmed its formula to be $C_{20}H_{24}O_4N_2$ and prepared its picrate, a methylgelsemicine hydriodide and a monobenzoyl derivative, the latter compound being found to be non-basic and presumably substituted on the nitrogen atom. Being extremely potent and toxic, gelsemicine appears to be the representative principle of gelsemium and it is necessary to investigate further its salts and derivatives. Gelsemicine hydrochloride contains 2 molecules of water of crystallisation when air-dried. When acetylated, gelsemicine gives a monoacetyl derivative which is also found to be non-basic, but forms a neutral oxalate. Well crystallised hydrobromide and acid oxalate of gelsemicine have also been prepared.

EXPERIMENTAL

Gelsemicine hydrochloride $C_{20}H_{24}O_4N_2 \cdot HCl \cdot 2H_2O$, it crystallises from alcohol with the addition of ether in colorless prismatic needles very soluble in water m.p. indefinite when air-dried. After being

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dried at 100-110°C for sometime, it melts at 141° and loses weight corresponding to 2 molecules of water of crystallisation.

Anal.—35 mg air-dried sub. lost 3 mg when heated to 110°C in vacuum till constant in wt: $H_2O = 8.5$

Calcd for $C_{20}H_{24}O_4N_2 \cdot HCl \cdot 2H_2O$: $H_2O = 8.4$

Acetylgelsemicine, $C_{20}H_{23}(CH_3CO)O_4N_2$, it is prepared by heating 0.15 g gelsemicine, 4 cc acetic anhydride and a trace of pyridine on the water bath for 3 hours and isolating the resulting acetyl derivative in an usual way. It crystallises from ether in rhombic prisms, m.p. 173°. Its alcoholic solution is neutral to litmus paper. Its analytical data corresponds to a monoacetyl derivative.

Anal.—Calcd for $C_{20}H_{23}(CH_3CO)O_4N_2$: C, 66.3: H, 6.5

Found: C, 66.6: H, 6.9

It forms a normal oxalate which crystallises from a little CH_3OH with the addition of acetone in prisms, m.p. 204°.

Anal.—Calcd for $(C_{20}H_{23}(CH_3CO)O_4N_2)_2H_2C_2O_4$: C, 62.3: H, 6.1
N, 6.3

Found: C, 62.3: H, 6.5: N, 6.5

Gelsemicine forms also a well crystallised hydrobromide, m.p. indefinite and an acid oxalate, rhombic prisms, m.p. 196°.

SUMMARY

Gelsemicine forms a hydrochloride containing 2 molecules of water of crystallisation when air-dried. It gives easily a monoacetyl derivative which is found to be non-basic but forms a normal oxalate.

LITERATURE

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