

Determinations of the rate of dialysis of chlorpromazine across Visking membranes qualitatively agree with these observations in that the rate of transport decreases as the drug concentration is increased above the cmc. This phenomenon may have applications in sustained release technology.

## REFERENCES

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**The use of methylene chloride and chloroform for the extraction of tertiary alkaloids from *Strychnos* species**

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When strychnine is extracted with chloroform a crystalline quaternary salt may separate out (Von Klemperer & Warren, 1955; Caws & Foster, 1956). Chloroform itself does not react with strychnine and it has been thought that methylene chloride, which is present as an impurity, is responsible (Caws & Foster, 1957). Strychnine refluxed with methylene chloride for 10 h gives the chloromethochloride which is not identical with the quaternary salt formed when chloroform is used. This salt is strychnine chloromethobromide formed from chlorobromethane another impurity in chloroform (Caws & Foster, 1957).

Chloroform and methylene chloride are both useful solvents for strychnine and related alkaloids which tend to be relatively insoluble in many common organic solvents. During the screening of *strychnos* material it was noted that a few alkaloid-rich extracts gave needle crystals which proved to be quaternary salts formed from strychnine-type alkaloids and methylene chloride. Although the indications from the literature (Caws & Foster, 1957) are that this is a slow reaction (see above) the present work shows that strychnine and brucine solutions in methylene chloride can form heavy crops of quaternary salt crystals within 2 h at laboratory temperature. Each of these salts gives two major spots on t.l.c. In order to study the behaviour of these compounds more closely the following quaternary salts of strychnine and brucine were prepared:—(a) chloromethochloride, (b) chloromethobromide, (c) bromomethochloride, (d) bromomethobromide.

T.l.c. of the mother liquors of the quaternary salts formed on allowing strychnine to stand in chloroform reveals the presence of three other major alkaloidal constituents. Two of these have been characterized as strychnine *N*-oxide and pseudostrychnine. Although this may cast doubt on whether these compounds occur naturally, control experiments have indicated that during normal extraction procedures only very small amounts of these compounds are formed.

Pseudostrychnine, pseudobrucine, icajine, novacine and vomicine do not appear to form quaternary salts with chloroform or methylene chloride.

It is clear from the work discussed above and from preliminary experiments with other alkaloids that the use of chloroform and methylene chloride may lead to considerable changes in the nature of alkaloids and their extracts. Hence when these solvents are used for alkaloid extraction care should be taken to determine whether or not the alkaloids remain chemically unchanged.

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