REFERENCES

1. Žáček, *Kolloid-Zeitschrift*, 1959, **165**, 170.
2. Žáček, *J. Pharm. Pharmacol.*, 1960, **12**, 191.
3. Walker and Zettlemoyer, *Am. Ink Maker*, 1949, **27**, No. 9, 67, through Fischer, *Colloidal Dispersions*, reprinted by Van Chong Book Company, Shanghai, 1950.
4. Pařízková, *Chemie* (Czech), 1951, **11**, 213.
5. Wald, *Sequential Analysis*, John Wiley, New York: Chapman and Hall, London, 1947.
6. Davies, edit., *The Design and Analysis of Industrial Experiments*, Chapter 3, Oliver and Boyd, Edinburgh and London, 1956.

The Critical Micelle Concentration of Polyethyleneglycolmonocetylether

SIR,—The recent paper of Elworthy[1] reporting the determination of the critical micelle concentration (CMC) of a commercial sample of cetomacrogol of molecular weight 1210 has prompted us to report values we have obtained for two commercial samples of polyethyleneglycolmonocetylether; one designated A complied with the B.P.C. 1959 requirements for Cetomacrogol 1000 and the other designated B failed to comply by virtue of 0·1 per cent excess

TABLE I

VALUES FOR THE CRITICAL MICELLE CONCENTRATION OF POLYETHYLENEGLYCOLMONOCETYLETHERS

Method of determination		Critical concentration per cent	
		Batch A	Batch B
Surface tension	1	0·00135	0·00082
	2	0·00119	0·00105
Light absorption ..	1	0·00132	0·00085
	2	0·00145	0·00093

water. In our experiments CMC values were obtained by observing changes in surface tension with concentration as measured by the Du Nouy tensiometer. Determinations were also made with the iodine method of Ross and Oliver[2], using a Unicam SP500 spectrophotometer. Our results are summarised in Table I.

Carless and Nixon[3] report values of 10^{-6} to 10^{-7} M with the Du Nouy tensiometer for the CMC of a sample of cetomacrogol which according to their data contained more ethylene oxide residues than that required by the B.P.C. 1954. As these workers assumed a molecular weight of 1300, their values for the CMC may be expressed as 0·00013 to 0·000013 per cent.

Working with specially prepared samples of polyoxyethylene alcohols, Cohen[4] concluded from surface tension measurements, that for a given alcohol, the CMC was independent of the number of ethylene oxide units. This is to be contrasted with the findings of Becher[5], whose work indicates that for a given alcohol, the CMC varies as the number of ethylene oxide units is increased. The value for the CMC obtained by Cohen[4] for the reaction products of ethylene oxide with cetyl alcohol, was $\frac{M}{50{,}000}$, which for $C_{16}H_{33}O[CH_2CH_2O]_{20}H$, gives a value of 0·00225 per cent.

We have, therefore, values of 0·007[1], 0·001–0·0009 and 0·0001 to 0·00001[3] per cent for the CMC of commercial samples and 0·00225 per cent for a pure sample of this class of compound.

Kushner and Hubbard[6] suggested that variable composition of Triton x-100, an alkylaryl polyethylene oxide, was the cause of their failure to reproduce the value of the CMC reported by Gonick and McBain[7], and it is interesting to speculate that a similar explanation is applicable to the variable results for commercial samples of polyethyleneglycolmonocetylethers.

W. B. HUGO,
J. M. NEWTON.

Department of Pharmacy,
The University,
Nottingham.

May 10, 1960.

REFERENCES

1. Elworthy, *J. Pharm. Pharmacol.*, 1960, **12**, 293.
2. Ross and Olivier, *J. phys. Chem.*, 1959, **63**, 1671.
3. Carless and Nixon, *J. Pharm. Pharmacol.*, 1957, **9**, 963.
4. Cohen, *Mem. services, chim. etat.* (Paris), 1951, **36**, 93.
5. Becher, *J. phys. Chem.*, 1959, **63**, 1675.
6. Kushner and Hubbard, *J. phys. Chem.*, 1954, **58**, 1163.
7. Gonick and McBain, *J. Amer. chem. Soc.*, 1947, **69**, 334.