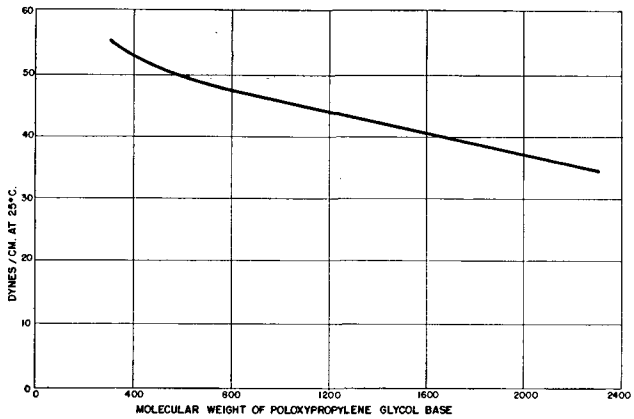

FIG. 6. Surface tensions of solutions of nonionics derived from polyoxypropylene glycols vs. molecular weight of the base. Oxyethylene content 38%. 0.1% concentration at 25°C.

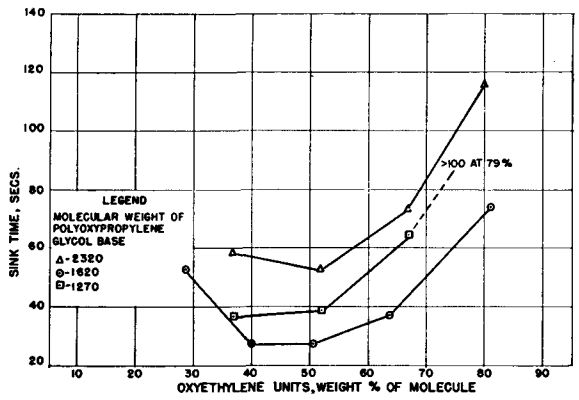

FIG. 7. Canvas disc wetting speeds of nonionics derived from polyoxyalkylene glycols vs. oxyethylene content. 0.1% concentration at 60°C.

seconds. As the molecular weight of the base was increased, the sink times decreased until at a molecular weight of approximately 1,600 for the polyoxypropylene glycol base, they reached 28 seconds. The products in this case contained between 40 and 50% by weight of oxyethylene units. Further increases in the molecular weight again resulted in an increase in the sink time. Figure 7 shows the variation in sink time for products derived from polyoxypropylene glycols having molecular weights of approximately 1,200, 1,600, and 2,300 as a function of the variation in oxyethylene content. It will be noted from these curves that the most effective products for wetting action, as measured by the canvas disc test, are those containing in the range of 40 to 50% by weight of oxyethylene units in the finished product.

Summary

A versatile new class of nonionic surfactants has been prepared essentially from ethylene and propylene oxides. The new products are based upon the discovery that a polyoxypropylene glycol having a molecular weight of approximately 900 or higher will function as the hydrophobic unit of a nonionic surfactant which may presumably be represented as $HO(C_2H_4O)_a\ (C_3H_6O)_b\ (CH_2O_4)_cH$. By selection of a polyoxypropylene glycol having a suitable molecular weight and by adjusting the weight ratio of oxypropylene to oxyethylene units in the product, nonionics have been prepared which range in physical form from liquids to solids which are sufficiently hard that they may be flaked.

The possibility of wide variation in the molecular weight of the hydrophobic unit and in the weight ratio of the hydrophobic to hydrophilic units in the molecules allows extensive tailoring of the products to give specific control of properties such as solubility in water, detergency, wetting action, and surface tension lowering.

REFERENCES

1. Ogg, C. L., Porter, W. L., and Willits, C. O., Ind. Eng. Chem., Anal. Ed., *17*, 394 (1945).
2. Vaughn, T. H., and Suter, H. R., J. Am. Oil Chem. Soc., *27*, 249-257 (1950).
3. Seyferth and Morgan, Am. Dyestuff Reporter, *27*, 525 (1939).

[Received October 30, 1951]

Report of the Referee Board

THIS report for the 1951-52 period is very routine as no new or major problems arose. The policies established by previous Boards have been closely followed. For the year ending May 31, 1952, thirty-four Referee Chemists were appointed. All except two were renewals. Twenty-four were given certificates on cottonseed, oil cake and meal, and fatty oils. Ten held restricted certificates either by choice of application or by the discretion of the Board.

The chemists are located in 12 states and 22 cities and represent 19 different laboratory organizations.

Many inquiries were received during the year relative to certification and handled as expeditiously as possible.

The Board again strongly urges any prospective applicants to participate in the Smalley Check Sample Program and to complete and report their results according to schedule. Performance on the check sample work has considerable bearing on our decisions.

Applications for certification for the 1952-53 period have already been given some consideration, and they were handled before May 31.

R. R. KING
J. R. MAYS JR.
A. S. RICHARDSON
A. E. BAILEY
R. W. BATES, *chairman*