constants were obtained for the mutarotation in the *p*H range 8.6 to 12, and for the hydrolysis in the *p*H range 0 to 9.5. For L-arabinosylamine, the mutarotation constant equals $(2.1 \times 10^8 [\overset{+}{H}])/(1 + 1.6 \times 10^9 [\overset{+}{H}])$, and the rate constant for the hydrolysis reaction equals $1/(7.9 + 6.1 \times 10^4 [\overset{+}{H}] + 4.2 \times 10^8 [\overset{-}{OH}])$. The curves of the figure correspond to these equations, and the points represent experimental values. The mutarotation of glycosylamines, in marked contrast to the mutarotation of sugars, is strongly catalyzed by oxonium ion, but not appreciably by hydroxyl ion. The hydrolysis, like certain enzymic reactions, takes place rapidly only in a limited *p*H range.

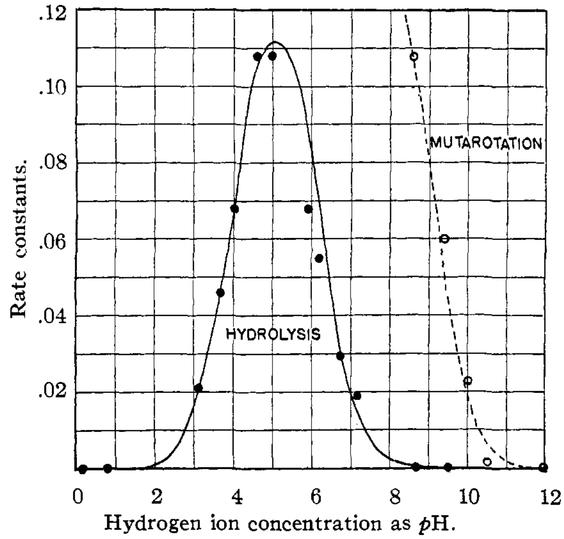

Fig. 1.

It has been found that the velocities of other reactions of the glycosylamines, now being studied, exhibit a similar dependence upon the *p*H of the reaction medium. In a forthcoming publication mechanisms will be presented to account for this striking property. The mechanisms seem pertinent to reactions of the N-glycosides and to reactions involving imine and aldehyde ammonia compounds in general.

NATIONAL BUREAU OF STANDARDS HORACE S. ISBELL
WASHINGTON 25, D. C. HARRIET L. FRUSH

RECEIVED DECEMBER 27, 1949

COHERENT ION-EXCHANGE GELS AND MEMBRANES

Sirs:

At the recent Gordon Research Conference on ion exchange a brief account was given by us of some electrochemical and exchange properties and uses of coherent cation- and anion-exchange membranes and gels which have been prepared in this laboratory. These materials may be classified as permselective electronegative and electropositive membranes. Other materials have been made and so defined by C. E. Marshall and collaborators [THIS JOURNAL, **63**, 1911 (1941)] and by Karl Sollner and collaborators [*J. Gen. Physiol.*, **24**, 467 (1941)]. Recently J. R. Wyllie described cation membranes made by embedding granular Amberlite IR-100 (Rohm and Haas) in a plastic binder [see *Chem. Eng. News*, **27**, 1797, June 20 (1949)]. In contrast with these membranes and with the collodion and clay membranes, the new materials have unusually high specific electric conductivities and exchange capacities.

A typical resinous sulfonic cation-exchange membrane, now available in the hydrogen or sodium form under the name Ionics[1] permionic membrane, cast in the form of disks, 9 cm. in diameter and 2–3 mm. thick, was tested as shown in Fig. 1, measuring at 25° its characteristic concentration potentials in the system

Calomel electrode	Satd. KCl soln. diffusion protected	0.1 *M* HCl soln.	Membrane	0.01 *M* HCl soln.	Satd. KCl soln. diffusion protected	Calomel electrode

The order of magnitude of its specific conductivities was measured in the same apparatus by comparing the internal resistance in 6 *N* hydrochloric acid in the presence and absence of the membrane. Similar anion-exchange membranes have also been prepared and are under investigation.

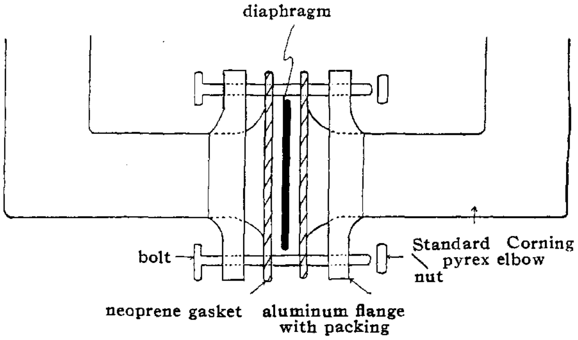

Fig. 1.—Exploded section of diaphragm cell. Ion-exchange diaphram, 3 mm. thick, 75 mm. diameter.

This resinous sulfonic cation exchanger was found to have a characteristic concentration potential of 54–55 millivolts, a specific conductivity of the order of 0.02–0.03 ohms^{-1} × cm.$^{-1}$, an exchange capacity of 0.4–0.6 milliequivalent per gram of wet hydrogen form material, and a moisture content of the order of 65% of the wet hydrogen form.

Numerous theoretical and practical applications of these materials in ion exchange as well as in the study and use of electrolytic systems are under active investigation.

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RECEIVED AUGUST 9, 1949

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(1) Ionics Incorporated, 152 Sixth Street, Cambridge 42, Massachusetts.