

mercury in 0.1 *N* sodium chloride and 0.1 *N* potassium chloride solutions. The following inhibitors were included at a concentration of 0.03 per cent: sodium tetraborate, sodium benzoate, trisodium orthophosphate, potassium dichromate, sodium nitrite and sodium silicate. All these inhibitors affected the positive (less negative) branch of the electrocapillary curve, indicating the adsorption of the anions of these inhibitors on the positively charged mercury surface. Such behaviour in this type of inhibitors is among the requirements of De's theory regarding solid metals.

In electrocapillary phenomena, particularly from the point of view of corrosion inhibition, competitive adsorption must be of importance. In aqueous solutions a number of ions are usually present which can compete for sites on a metal surface. Phenomena associated with such competitive processes should, therefore, be taken into consideration in an electrocapillary approach to corrosion inhibition. With this in mind, an attempt was made to determine the action of a given inhibitor on the electrocapillary curve which was obtained in the presence of another inhibitor. Among the above inorganic inhibitors studied, it was found that the effect of potassium dichromate on the electrocapillary curve was independent of any other inhibitor present. Alternatively, in a solution containing potassium dichromate, addition of one or more of the rest of the inhibitors had no further effect on the electrocapillary curve. This result can be considered as representing a case of competitive adsorption where dichromate ions are the most strongly adsorbing among the ions considered. They can thus displace the other ions from the mercury surface; the reverse process does not take place at the concentrations employed. Competitive adsorption in corrosion inhibition could probably be studied indirectly—by dissolution rates and/or electrode potential measurements—much more conveniently than by the electrocapillary action of inhibitors on solid metals.

These results on mercury cannot, of course, serve as a direct verification of the electrocapillary action of corrosion inhibitors; but they will encourage electrocapillary studies on solid metals.

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<sup>1</sup> Indelli, A., and Pancaldi, G., *Gazz. Chim. Ital.*, **83**, 555 (1953).

<sup>2</sup> Gatos, H. C., *J. Electrochem. Soc.*, **101**, 433 (1954).

<sup>3</sup> Mann, C. A., *J. Electrochem. Soc.*, **89**, 115 (1936).

<sup>4</sup> See also Gatos, H. C., *J. Chem. Educ.*, **31**, 533 (1954).

<sup>5</sup> Campbell, H. S., *J. App. Chem.*, **4**, 633 (1954).

<sup>6</sup> De, C. P., *Nature*, **180**, 803 (1957).

### Influence of Metallic Ions on the Reaction of Ethylene Diamine with Epinephrine and Norepinephrine

THE reaction of ethylene diamine with epinephrine (and norepinephrine) leads to the formation of a highly fluorescent material which is used for the estimation of catechol amines in biological fluids according to a procedure first described by Weil-Malherbe and Bone<sup>1</sup> and slightly modified by a number of other workers.

We found that the presence of metallic ions, even in traces, greatly influences the intensity of fluores-

cence obtained by this reaction. Among the salts that possess such a marked catalytic action are chiefly aluminium chloride (or acetate) and copper sulphate, although Erne and Canbäck<sup>2</sup> have utilized ammonium molybdate for the same purpose. Ferric chloride, on the other hand, appears to decrease the fluorescence of epinephrine while copper sulphate decreases that of norepinephrine.

In the light of these findings, it is more than probable that the presence of aluminium salts in the eluate should be responsible, at least in part, for the increase of fluorescence observed when ethylene diamine is allowed to react with epinephrine dissolved in aqueous acetic acid solutions that have passed through an alumina column, as compared with solutions in pure acetic acid<sup>3,4</sup>. 10 ml. of acetic acid solution that had been passed through a column of 0.7 gm. of alumina prepared according to Weil-Malherbe and Bone were found to contain about 10  $\mu$ gm.  $Al^{+++}$ . The increase of fluorescence under such conditions was about 30 per cent. The addition of 10  $\mu$ gm.  $Al^{+++}$  (in the form of acetate or chloride) to pure acetic acid increased the fluorescence by 17 per cent. The difference, however, could be explained by the presence of other impurities in alumina. Spectrographic analysis of one sample of purified product (Brickman and Co., suitable for chromatographic adsorption) revealed the presence of minute amounts of copper, iron, gallium and silicium. The influence of these elements on this reaction is under investigation.

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<sup>1</sup> Weil-Malherbe, H., and Bone, A. D., *Biochem. J.*, **51**, 311 (1952).

<sup>2</sup> Erne, K., and Canbäck, T., *J. Pharm. Pharmacol.*, **7**, 248 (1955).

<sup>3</sup> Valk, A. de T., and Price, H. L., *J. Clin. Invest.*, **35**, 837 (1956).

<sup>4</sup> Mangan, G. F., and Mason, J. W., *Science*, **126**, 562 (1957).

### A Suggested Revision of Nomenclature—Angiotensin

THE vasoactive peptide resulting from the action of renin on an alpha-globulin was discovered by two groups of investigators with the result that it received two trivial names, angiotonin and hypertensin. Synthesis of the octapeptide has now confirmed the identity of this peptide and justifies dropping the double nomenclature. We propose the simplified name, angiotensin, and its derivatives angiotensinase and angiotensinogen. Angiotensin is a hybrid word but does, we think, have the advantage of being easy to pronounce even with a variety of accents, is euphonious, and is understandable despite the most recalcitrant microphone.

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