preparation of plastics, resins, etc., suitable for molding and coating.

Detailed description of the procedure and of the mostly new starch derivatives so prepared will be published later.

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RECEIVED APRIL 17, 1941

ABSORPTION OF OXYGEN BY GLUTATHIONE IN ALKALINE SOLUTIONS

Sir:

In a recent communication, Xan, Wilson, Roberts and Horton[1] have called attention to the fact that certain mercaptans in alkaline solution absorb more oxygen than should be required to oxidize them to the corresponding disulfides. These authors report that the amount of oxygen absorbed per mole of mercaptan increases with increasing hydroxide ion concentration with the formation of an unknown end-product of oxidation.

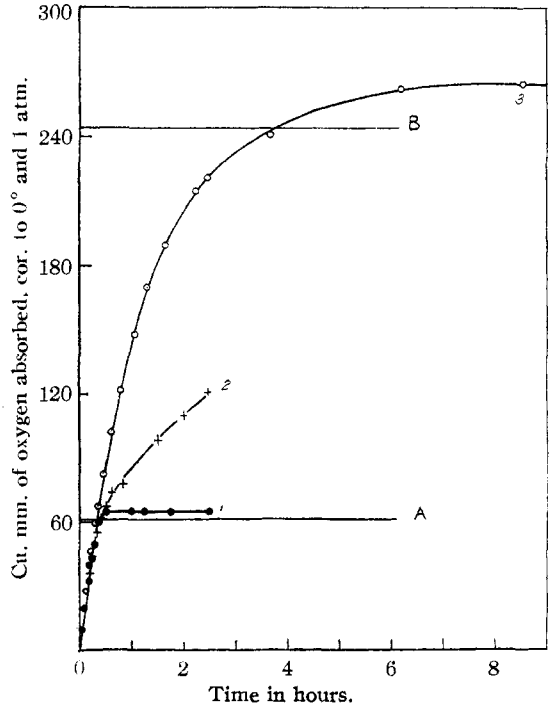

Fig. 1.—Absorption of oxygen at 37° and 1 atm. pressure by glutathione in alkaline solutions.

In an investigation under way in this Laboratory, the oxidation by oxygen of a mercaptan, glutathione, in alkaline solution with small amounts of copper sulfate as catalyst has been studied over a considerable range of hydroxide ion concentration. In this case also the amount of oxygen absorbed per mole of glutathione increases as the hydroxide ion increases and the end product, as indicated by the volume of oxygen absorbed, is predominantly the salt of the sulfinic acid. Figure 1 shows the results of three experiments in which approximately equal amounts of glutathione, 5 cc. of 0.00220, 0.00217 and 0.00218 molar solution, respectively, were oxidized by oxygen in the well-known Warburg apparatus at 37°. The concentrations of copper ion, assuming no reaction with either glutathione or hydroxide ion, were 4.70×10^{-6}, 4.63×10^{-6} and 3.70×10^{-6} molar, respectively. In Expt. 1, the initial *p*H of the solution is about 9.0. Although the volume of oxygen absorbed is somewhat higher than the calculated volume (represented by the straight line A) required to change the mercaptan to the disulfide, there is no indication of a further reaction involving the formation of a higher oxidation product. In Expt. 2, the hydroxide ion concentration is 0.0431 and there is definite evidence of a follow reaction after the formation of the disulfide. In Expt. 3, the hydroxide ion is 0.171. The straight line B indicates the calculated volume of oxygen absorbed to change the mercaptan to the sulfinic acid. Again the actual value is somewhat high and yet the type of curve and the apparent completion of the reaction indicate that the principal product formed is the salt of the sulfinic acid.

The rates of the above reactions increase with increase in copper sulfate concentration and oxygen pressure and, in general, the slower (but still complete) the reactions the nearer do the total oxygen absorptions approach the theoretical values for disulfide and sulfinic acid formation. The kinetics involved in the above reactions are now under consideration and further details will be given in a later publication.

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RECEIVED APRIL 19, 1941

A COLOR TEST FOR *p*-AMINOBENZOIC ACID, THE CHROMOTRICHIA FACTOR

Sir:

The following is a very delicate and simple test for the newest member of the vitamin B complex,

(1) Xan, Wilson, Roberts and Horton, THIS JOURNAL, **63** 1139 (1941).