invertase is consistent with the results of other studies (2, 8, 27). Thus, there does not appear to be any considerable volume change of activation in the reaction. In this respect it is different from the oxidative systems in bacterial luminescence which, according to an analysis at optimum pH and low temperatures, proceeds with a volume increase of around 50 cc. per mole (11).

An analysis was undertaken of the relation between hydrostatic pressure and invertase activity at pH 7.04–7.07 and at 35° and 40°C. Higher temperatures at this pH were not used because of evidence of irreversible, or not readily re-

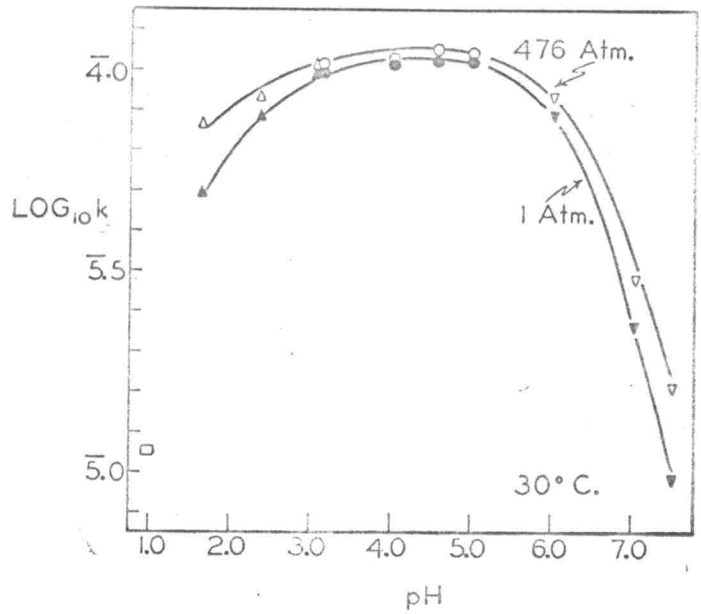

FIG. 3. Relation between pH and rate of hydrolysis of 10 per cent sucrose by 0.2 per cent invertase solution, under normal and 476 atm. hydrostatic pressure at 30°C. The square at pH 1.0 represents the rate either with or without the enzyme, and under either normal or increased pressure. At the higher pH's no appreciable hydrolysis occurred except in the presence of the enzyme.

The increase in rate under pressure amounts to scarcely 5 per cent at pH 4.75, but is 58 per cent at pH 7.5 and 38 per cent at pH 1.5.

△, glycine buffer; ○, acetate buffer; ▽, phosphate buffer.

versible, destruction of enzyme activity. The results are summarized in figure 5.

In figure 5, the data are treated according to fundamentally the same formulations which have been used with respect to luminescence and whose full derivation is given in the references cited. The present analysis is based on the assumption that the true value of the specific reaction rate, k, at the temperatures concerned may be obtained by extrapolating the low-temperature portion of the curve for this pH, as shown in figure 4. The decrease in rate beyond the maximum at about 30°C. is assumed to be due wholly to the rapid increase, with rise in temperature, of the equilibrium constant, K, of the reaction through which the