

appears justified, therefore, that the reduction in catalytic activity accompanying moderate increases in temperature or change in acidity is caused by a pressure-sensitive equilibrium reaction, through which the enzyme is partially inactivated. At pH 7.04–7.07, the strong influence of temperature on this reaction is suggestive of protein denaturation. Analysis of the pressure effect, as discussed in a following paragraph, substantiates the same view.

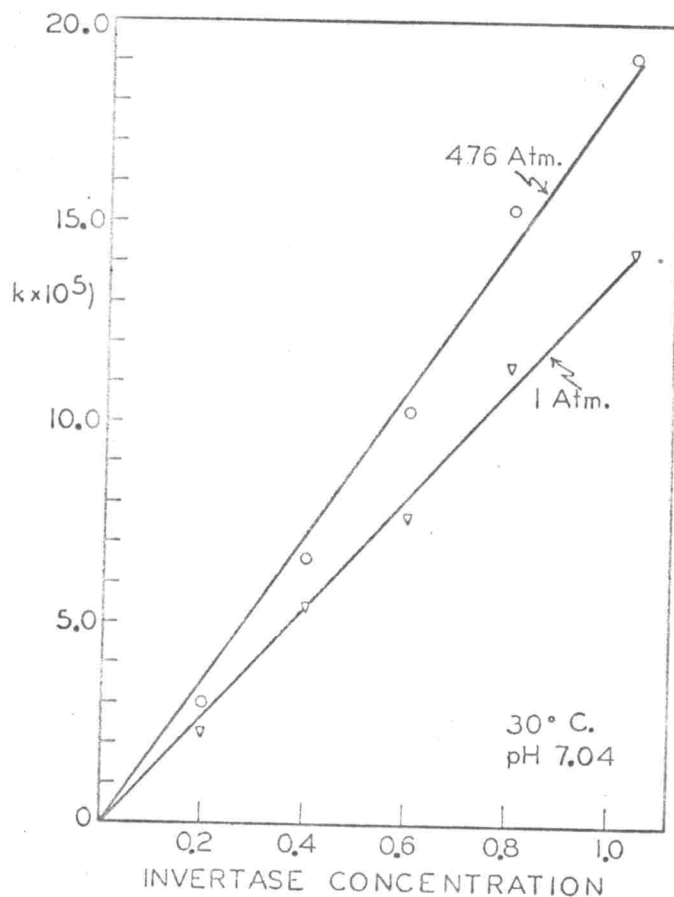


FIG. 1. Relation between concentration of enzyme and rate of hydrolysis of 10 per cent sucrose at 30°C. and pH 7.04, under normal pressure and 680 atm. hydrostatic pressure. The increase in rate under pressure is approximately 33 per cent. The numbers on the abscissa refer to the percentage concentration of the Difco invertase solution.

At optimum pH, or at low temperatures, pressure exerts relatively little effect on the reaction rate (figures 3 and 4). A slight acceleration, however, has been observed under these conditions, for reasons not entirely clear. Hydrostatic pressure alone caused no detectable hydrolysis of the sucrose, and no significant effect of pressure was observed on the rate of hydrolysis at pH 1.0. At this pH, though not at more alkaline pH, acid causes considerable hydrolysis of the