TABLE II

INVOLVEMENT OF PRPP AND ATP IN THE SYNTHESIS OF GAR

Basic system: 5 μM C^{14}-glycine, 5 μM L-glutamine, 7 μM $NaHCO_3$, 2 μM L-azaserine, 0.3 ml. 0.03 *M* phosphate buffer, *p*H 7.4, containing 0.13 *M* KCl and 0.01 *M* $MgCl_2$, and 10 mg. of dialyzed, Norite-treated 15–45% ethanol fraction of pigeon liver extract; incubated 45 minutes at 38°.

Addition to basic system	μM. GAR synthesized
None	0.00
Ribose-5-phosphate, 2 μM.	0.02
ATP, 2 μM.	0.04
Ribose-5-phosphate + ATP, 2 μM. each	0.07
PRPP, 2 μM.	0.13
PRPP + ATP, 2 μM. each	0.43

It is seen in Table II that PRPP is the active ribose phosphate moiety in this ribotidation reaction but that maximal synthesis is realized only when PRPP and ATP are present together. These experiments demonstrate the requirement for ATP in a step in the formation of GAR other than that concerned with pyrophosphorylation of ribose-5-phosphate.

DIVISION OF BIOCHEMISTRY
DEPARTMENT OF BIOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE 39, MASSACHUSETTS

STANDISH C. HARTMAN
BRUCE LEVENBERG[12]
JOHN M. BUCHANAN

RECEIVED DECEMBER 2, 1954

(12) Public Health Service Research Fellow of National Institute of Neurological Diseases and Blindness. Work supported by Grants from the Damon Runyon Memorial Fund for Cancer Research and the National Cancer Institute, National Institutes of Health, United States Public Health Service.

A NEW CRITICAL VOLUME EFFECT IN HIGH POLYMER SOLUTIONS

Sir:

Staudinger[1] and several other authors[2] have predicted from the length of the macromolecules that these would be separated from each other in very dilute solution, but on the contrary would form a continuous network in concentrated solution. The transition from a discontinuous to a continuous solution would be expected to take place at a critical value of the concentration.

Streeter and Boyer[3] by viscosity measurements of very dilute solutions of polystyrene in toluene, have observed a phenomenon which they have attributed to this critical concentration. Daoust and Rinfret,[4] studying the heats of mixing of polyvinyl acetate in S-dichloroethane and S-tetrachloroethane, discovered at high dilution the existence of a concentration at which the graph of heat of mixing *vs.* volume fraction shows an inflection point. Parent and Rinfret[5] have subsequently shown that the value of these critical concentrations varied inversely as the molecular weight of the P.V.A.

We have thought here that it was possible to determine those critical concentrations by very precise measurements of the specific partial volume at high dilution. Using a magnetically controlled float similar to that of Lamb and Lee,[6] we have attained a precision of $\pm 1 \times 10^{-6}$ g. ml.$^{-1}$. Five series of density measurements of carefully fractionated P.V.A. in dilute chlorobenzene solutions were made; Fig. 1 shows that at concentrations lower than one gram per hundred grams of solution, each molecular weight gives rise to a different inflection point in the graph of density *vs.* concentration.

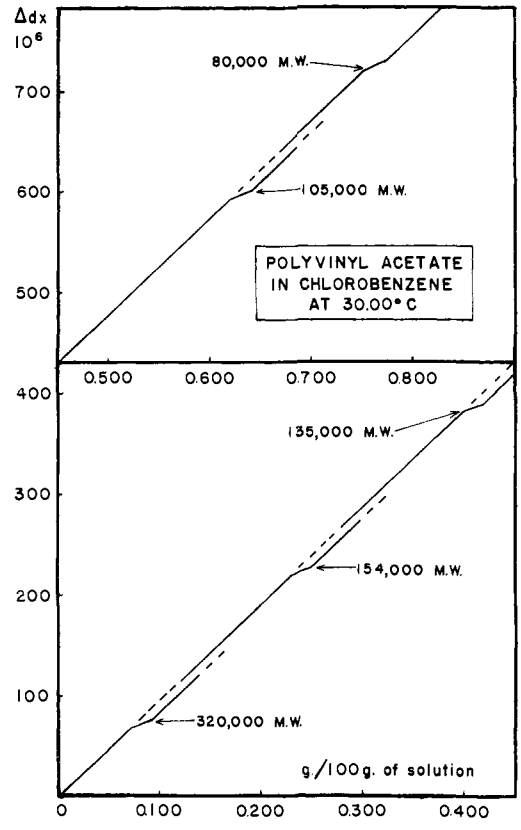

Fig. 1.

As the position of these inflection points shifts downward with increasing molecular weight, it would seem that the phenomenon observed confirms the prediction of Staudinger, *et al.*, about the change of structure of the polymer in solution with concentration.

(1) H. Staudinger, "Die hochmolekularen organischen Verbindungen," Springer, Berlin, 1932, p. 128.
(2) R. F. Boyer and R. S. Spencer, *J. Polymer Sci.*, **5**, 375 (1950).
(3) D. J. Streeter and R. F. Boyer, *ibid.*, **14**, 5 (1954).
(4) H. Daoust and M. Rinfret, *Can. J. Chem.*, **32**, 492 (1954).
(5) M. Parent, Ph.D. Thesis, Université de Montréal, 1954.
(6) A. B. Lamb and R. E. Lee, THIS JOURNAL, **35**, 1668 (1913).

DÉPARTMENT DE CHIMIE
UNIVERSITÉ DE MONTRÉAL
MONTREAL, CANADA

ALCIDE HORTH
MARCEL RINFRET

RECEIVED DECEMBER 7, 1954

PHOSPHORYLATION COUPLED WITH ELECTRON TRANSPORT TO CYTOCHROME C BY SOLUBLE ANIMAL ENZYMES

Sir:

Intramitochondrial diaphorase is inhibited by hydroxylamine. Soluble diaphorase is not inhibited. A factor necessary for this inhibition was isolated from guinea pig liver.[1] We observed that

(1) I. Raw, *Science*, **118**, 159 (1953).