CHEMISTRY

Chairman: ROBERT E. DAVIS, Purdue University

G. B. BACHMAN, Purdue University, was elected chairman for 1967

ABSTRACTS

Reduction of Enamines with Secondary Amines. A. G. COOK and C. R. SCHULZ, Valparaiso University.—Various cyclic, acyclic and aromatic secondary amines reduce enamines to the corresponding saturated tertiary amines. The reaction is acid catalyzed, and the transfer of a hydride ion from the secondary amine to the protonated enamine yields an imine as the oxidation product. Secondary amines reduce bicyclic enamines from the less hindered *exo* side.

Homoconjugate Addition of Morpholine to Bicyclic Ketones. A. G. COOK and W. M. KOSMAN, Valparaiso University.—Morpholine adds to norbornenone under both acidic and basic conditions. Under basic conditions a homoenolate ion must be involved in the addition reaction.

Ionization Potentials of Three Hydrides of Phosphorus. ROBERT B. CALLEN, University of Notre Dame.—The application of electron impact mass spectrometry for the determination of ionization potentials is well documented. One technique that has recently been employed in the study of ionization processes of polyatomic molecules is the retarding potential difference (RPD) method developed by Fox and coworkers. This method provides a means of obtaining essentially monoenergetic electrons. Subsequently, ionization efficiency curves obtained by the R.P.D. technique are linear in the region of the threshold potential and allow an unambiguous determination of the ionization potential to be made. In this study the ionization potentials of three hydrides of phosphorus—phosphine, PH_3, diphosphine, P_2H_4, and triphosphine, P_3H_5,—have been determined. The ionization potentials of the corresponding deuterium substituted compounds have also been obtained. The ionization potentials of phosphine, deuterated phosphine, diphosphine, and deuterated diphosphine were obtained by the R.P.D. technique. Ionization potentials of triphosphine, and deuterated triphosphine were determined by the semi-log matching method.

Phosphine and diphosphine were prepared by hydrolysis of calcium phosphide and separated by trap to trap distillation. Triphosphine was prepared by pyrolyzing diphosphine in a hot-cold reactor and was isolated by fractional codistillation. All ionization potentials were obtained on a Bendix model 12-107 time-of-flight mass spectrometer. The measured ionization potentials are shown in Table 1.

TABLE 1.

Compound	Ionization Potential
PH_3	10.05 ± 0.05 ev
P_2H_4	9.15 0.05 ev
P_3H_5	8.85 0.10 ev
PD_3	10.05 0.05 ev
P_2D_4	9.16 0.05 ev
P_3D_5	8.85 0.10 ev

The Association of Ribonuclease with Yeast Ribosomes. R. K. BRETTHAUER and R. K. HAROZ, University of Notre Dame.—Polypeptide synthesis in cell-free extracts of various microorganizms is complicated by the presence of ribonucleases. In extracts of the hybrid yeast *Saccharomyces fragilis* x *S. dobzhanskii* three ribonucleases can be identified, two soluble and one associated with the ribosomes. Incubation of polyribonucleotides with ribosomes results in extensive loss (75%) of template activity whereas incubation with ribosome-free cell extract results in only 10% loss of activity. Partial inhibition of the ribosomal nuclease activity alters the nature of the peptides synthesized. As these experiments suggest that the ribosomal nuclease may be a limiting factor in cell-free protein synthesis, some properties of the enzyme have been examined. The amount of nuclease activity associated with the ribosomes is greatest in early log cells, activity decreasing with time of growth. The enzyme is activated in the ribosome with urea and can be released with urea or lithium chloride. Natural and synthetic polyribonucleotides are degraded.

Structural Differences between Heart Cytoplasmic and Mitochondrial Glutamate Aspartate Transaminases. M. MARTINEZ-CARRION and D. TIEMEIER, University of Notre Dame.—Glutamate aspartate transaminases (E.C. 2.6.1.1. L-aspartate: 2-oxoglutarate aminotransferase) with different cytological localizations have been isolated in large quantities in a very high degree of purity by ion exchange chromatography. Previous work done in less pure material had shown different Michaelis constants for their common substrates for both forms of the enzyme (Wada, H. and Morino, Y., Vitamins and Hormones, *22*, 411, 1964). The amino acid composition of these two isozymes has now been determined on samples subjected to acid hydrolysis before and after performic acid oxidation. The number of tryptophan residues and the amount of free sulphydryl groups were measured by different spectrophotometric methods. This complete analysis shows a marked dissimilarity in the amino acid composition of the two enzymes. This difference in structure is also apparent in peptides maps obtained for both enzymes after tryptic hydrolysis. By this technique it is also possible to show that the mitochondrial enzyme like the supernatant one, although of different chemical composition, is a dimer consisting of two identical polypeptide chains.

These results will be discussed in terms of the enzyme structure and its genetic implications.

Injectionless Gas Chromatography. D. MEYERS and F. SCHMIDT-BLEEK, Purdue University.—It is known that the injection of pure carrier gas as a sample into a gas chromatographic system which has impurities in the carrier gas, causes the impurities to show up as a series of negative peaks. A similar effect has been observed by causing an in situ fractionation of carrier gas and impurities by means of a sudden flow increase through a small orifice or through a capillary.