Proceedings of the Iowa Academy of Science

Volume 49 | Annual Issue Article 47

1942

Stability of Cysteine Solutions

Ronald E. Pyle
State University of Iowa

Joseph I. Routh
State University of Iowa

On standing for several days, the light yellow material acquired a dark greenish-blue color, later becoming practically black. Presumably this color change was due to intra-molecular oxidation and nitration giving a mixture of products very difficult to identify.

CORNELL COLLEGE
MT. VERNON, IOWA

RING CLOSURE OF N-METHYLCYCLOHEPTYLAMINE

GEORGE H. COLEMAN AND JOSEPH J. CARNES

Previous work in this laboratory has shown that secondary N-chloroalkylamines lose the elements of hydrogen chloride to form heterocyclic amines when heated in sulfuric acid solution. This reaction has now been applied to the preparation of the bicyclic compound tropane (8-Methylazabicyclo [3, 2, 1] octane).

N-Methylcycloheptylamine was prepared from cycloheptanone and methylamine by condensation and reduction of the resulting imine. This compound formed 85-95% yields of the chloromine when treated with chlorine. The N-chloro-N-methylcycloheptylamine when heated at 65°-67° in 84% sulfuric acid gave tropane in 40-42% yields. This was identified by its physical constants and by the melting points of the picrate, chloroplatinate, and chloroaurate.

DEPARTMENT OF CHEMISTRY
STATE UNIVERSITY OF IOWA
IOWA CITY, IOWA

STABILITY OF CYSTEINE SOLUTIONS

RONALD E. PYLE AND JOSEPH I. ROUTH

The stability of cysteine in acid solution increased with increase in acidity (0.1 to 6N HC 1). When the solutions were made in conductivity water and stored under nitrogen, less than 1 per cent of the cysteine was oxidixed in 7 days.

Cysteine did not appear to be oxidized when it was subjected to the conditions obtaining in the hydrolysis of proteins by acids. Treatment of cysteine solutions with decolorizing charcoal pro-

duced extensive oxidation to cystine. During similar treatment with kaolin no appreciable oxidation occurred.

When cysteine was added to proteins and the mixture was subjected to acid hydrolysis only about half (40 to 70 percent) of the added cysteine could be recovered even when kaolin was used as a decolorizing agent. Since cysteine added to a protein hydrolysate can be completely recovered the exposure of cysteine to hydrolyzing conditions in the presence of protein is probably responsible for its destruction. The figures given for the cysteine content of proteins must be regarded as minimal and cysteine probably occurs more widely in proteins than is ordinarily believed.

Biochemical Laboratory
State University of Iowa, Iowa City

INTERMEDIARY METABOLISM OF HISTIDINE

Robert Crookshank and Clarence P. Berg

The two optical isomers of β-4-imidazolelactic acid were prepared from the *d*-and *l*- histidine monohydrochlorides by means of silver nitrite. These were fed in diets containing casein hydrolysates from which the histidine had been removed by precipitation as the silver salt (Hydrolysate A) or as the mercuric sulfate complex (Hydrolysate B). Slow to moderate growth was obtained in rats fed diets containing Hydrolysate A when supplements of either *l*- or *d*- imidazolelactic acid were added; growth in the former instance was greater than in the latter. Rats fed the unsupplemented diets failed to grow. When the diet contained Hydrolysate B, supplements of *l* imidazolelactic acid did not promote growth, but supplementation with histidine did. A precipitate was obtained by subjecting Hydrolysate A to the procedure used for preparing Hydrolysate B. When this precipitate was freed of mercury and sulfate ions and added to diets containing Hydrolysate B and imidazolelactic acid, growth occurred.

Further studies are being conducted.

Biochemical Laboratory
State University of Iowa, Iowa City