It is interesting to note that the presence of activity in the microsomal fraction with requirement of a reduced coenzyme is identical with systems described for adrenal hydroxylation[5]. The high yields obtained are consistent with a quantitatively significant role for the reaction. Detailed studies of the mechanisms involved are now in progress.

The author wishes to express his appreciation to Miss ANN FOLEY for technical assistance.

Research Laboratories of the Boston Lying-in Hospital and the Department of Obstetrics, Harvard Medical School, Boston, Mass. (U.S.A.) KENNETH J. RYAN

1 A. S. MEYER, *Biochim. Biophys. Acta*, 17 (1955) 441.
2 B. BAGGETT, L. L. ENGEL, K. SAVARD AND R. I. DORFMAN, *J. Biol. Chem.*, 221 (1956) 931.
3 H. H. WOTIZ, J. W. DAVIS, H. M. LEMON AND M. GUT, *J. Biol. Chem.*, 222 (1956) 487.
4 S. SOLOMON, R. VANDE WIELE AND S. LIEBERMAN, *J. Am. Chem. Soc.*, 78 (1956) 5453.
5 K. J. RYAN AND L. L. ENGEL, *J. Biol. Chem.*, 225 (1957) 103.
6 M. L. SWEAT, *Anal. Chem.*, 26 (1954) 773.
7 L. L. ENGEL, W. R. SLAUNWHITE, P. CARTER AND I. T. NATHANSON, *J. Biol. Chem.*, 185 (1950) 255.

Received November 18th, 1957

Isolation and identification of β-mercaptopyruvate desulfurase*

Earlier experiments of MEISTER *et al.*[1] demonstrated that liver extracts decompose β-mercaptopyruvate to sulfur and pyruvate. More recently SÖRBO[2] reported that homogenates of rat liver and kidney as well as blood cells catalyse the transfer of sulfur from β-mercaptopyruvate to sulfite and sulfinates. These observations suggest that there are at least two types of enzymes which attack β-mercaptopyruvate and result in either "desulfuration" or "transsulfuration".

In the course of our studies dealing with enzymic reactions of cysteine and β-mercaptopyruvate[3,4,5,6] we have isolated a protein from rat liver which in the absence of a sulfur acceptor cleaves β-mercaptopyruvate to sulfur and pyruvate. In agreement with the observations of MEISTER *et al.*[1] we find that β-mercaptoethanol activates this reaction. Sulfite in the absence of mercaptoethanol also increases the rate of enzyme-catalyzed pyruvate formation from β-mercaptopyruvate. In confirmation of SÖRBO's results[2] we find that sulfite is converted to thiosulfate in the course of the latter reaction.

Ultracentrifugal and electrophoretic analyses revealed that our purified enzyme is at least 85 to 95% homogeneous. Thus, it appears that desulfurase and transsulfurase activities are associated with a single protein. The course of reaction is determined by experimental conditions (*e.g* presence of sulfur acceptors). Certain physical properties of this enzyme are: isoelectric point, 7.4; S_{20}, 2.7; D, $5.2 \cdot 10^{-6} cm^2 sec^{-1}$; mol.wt. (from S_{20} and D), 35,000–40,000; absorption maxima, 280 mμ and 415 mμ, $E_{280\ m\mu}/E_{415\ m\mu}$, 15.7; $E_{415\ m\mu}$, 56; S content, 4 atoms/mole. Spectrographic analyses revealed copper as the single metallic constituent of this protein. The protein in its purified form easily loses copper with concomitant loss of enzymic activity. Quantitative copper analyses are for this reason uncertain. It is estimated that two atoms of copper may be associated with one molecule of enzyme. Preliminary analyses indicate that two sulfhydryl groups are present per enzyme molecule as measured by the spectrophotometric method of BOYER[7]. Further biochemical properties of this enzyme as well as methods for its isolation will be published in detail.

Department of Pharmacology and Experimental Therapeutics, The University of California School of Medicine, San Francisco, Calif. (U.S.A.) ERNEST KUN** DEAN W. FANSHIER

1 A. MEISTER, P. E. FRASER AND S. V. TICE: *J. Biol. Chem.*, 206 (1954) 561.
2 B. SÖRBO, *Biochim. Biophys. Acta*, 24 (1957) 324.
3 E. KUN AND J. L. BRADIN, JR., *Biochim. Biophys. Acta*, 11 (1953) 312.
4 E. KUN, J. L. BRADIN, JR. AND J. M. DECHARY, *Biochim. Biophys. Acta*, 19 (1956) 153.
5 E. KUN, *Biochim. Biophys. Acta*, 25 (1957) 135.
6 W. D. KUMLER AND E. KUN, *Biochim. Biophys. Acta*, 27 (1958) 464.
7 P. D. BOYER, *J. Am. Chem. Soc.*, 76 (1954) 4331.

* Supported by grants of the U.S. Public Health Service (Heart H-2897 and Cancer C-3211).
** Established Investigator of the American Heart Association, Inc.

Received December 15th, 1957