TECHNICAL SECTION

JOURNAL OF Agricultural and Food Chemistry

- Biochemical Engineering
- Fermentation
- Food Processing
- Nutrition
- Pesticides
- Plant Nutrients and Regulators

Browning Reaction Theories Integrated in Review

• "Chemistry of Browning Reactions in Model Systems" is a paper from the Symposium on Dehydrated Foods, presented at the 123rd Meeting of the ACS in Los Angeles. The reactions leading to the production of brown pigments at moderate temperatures in foods have been the subject of a great deal of study. A number of ideas and theories have been advanced to explain their occurrence under various conditions and in various materials. Hodge has developed a comprehensive review of the work, integrating various theories and showing existence of relationship among several different reactions which have been found significant in browning. Relationship is found among carbonyl-amino, carmelization, and enzyme-catalyzed oxidation reactions, on the basis that browning can be regarded as stemming from carbonyl compounds. The compounds from which the reaction originates usually contain several carbonyl or potential carbonyl groups. Carbonyl compounds, such as sugars, can react with amines, as part of the Maillard reaction. By that reaction an *N*-substituted glycosylamine can be formed, from a reducing sugar, for example. The sugar moiety can be dehydrated to easily polymerizable unsaturated compounds from which the amine residue may drop off. The Amadori rearrangement may take place with certain of the sugar-amine products. Furfurals or reductones then may be formed. The latter brown by oxidative reaction. Several routes to melanoidin formation following the Amadori reaction are suggested. A mechanism is indicated for browning in the absence of atmospheric oxygen.

pages 928 to 943

Ammoniated Industrial By-products Have Dairy Feed Value

• Certain sources of nonprotein nitrogen are known to be utilizable for growth and production by ruminants. Magruder, Knodt, and Williams, seeing possible applications of industrial by-products as feed for dairy cattle, have studied the use of ammoniated hemicellulose extracts as a replacement for soybean oil meal in dairy rations. Body weight gains and digestibility coefficients were comparable, as were hair coats and general appearance of the heifers. To examine acceptability and safety, ammoniated cane molasses was fed in levels up to 50% of the grain ration. Neither toxic effects nor resistance to feed was observed, while protein digestibility coefficient was satisfactory.

pages 944 to 946

Schradan Metabolism Related to Tissue Enzyme System

• Schradan appears to kill insects by inhibiting the cholinesterase of the nerves. However, its toxicity is selective. O'Brien and Spencer suggest a hypothesis that the only substantial contribution to poisoning is made by schradan converted to anticholinesterase in the nerve cord. In nonsusceptible insects so much of the conversion occurs in the fat body that little schradan reaches the nerve unchanged. This hypothesis is considered in the light of systems which appear to effect conversion of various insect or mammal systems which are not susceptible, of inhibitors and of the mechanism of oxidation of schradan.

pages 946 to 950

Vitamin B_{12} in Microbial Material Determined Rapidly

• The analytical determination of vitamin B_{12} in natural substances has been difficult. Fisher presents a simple rapid spectrophotometric method which is faster and more accurate than bioassay. The vitamin is extracted selectively with benzyl or *n*-propyl alcohol containing cyanide ions and water to effect a separation after which determination is relatively easy. Useful applications seem likely in control of fermentation production of vitamin B_{12} and standardization of finished products.

pages 951 to 953