

*Molecular Modeling Techniques in Material Sciences* would be very useful to scientists researching or working on molecular modeling applications in industry.

John F. Kennedy\*

Rajdeep K. Sandhu

*Chembiotech Laboratories, Institute of Research & Development, University of Birmingham Research Park, Birmingham B15 2Q3, UK*

Available online 2 February 2006

---

\* Corresponding author

doi:10.1016/j.carbpol.2005.09.016

---

**K. F. Gotlieb, A. Capelle (Eds.), Starch derivatization; Fascinating and unique industrial opportunities, Wageningen Academic Publishers, The Netherlands, 2005 (158pp., €45, ISBN 9076998604)**

Starch has many uses in food and other industries such as paper and textile industry. It renewable and cheap. starch can be produced from plants like corn, tapioca and potato. *Starch derivatisation; Fascinating and unique industrial opportunities* discusses the derivatisation and application of polysaccharides and natural polymers.

*Starch derivatization; Fascinating and unique industrial opportunities* begins with focusing on the starch granule, where structural elements, surface layers, channels, pores and voids, surface substitution, hydrolysis, dried and never dried starch have all been discussed. Derivatisation in aqueous alcohols is discussed, the first part talks about native starch explaining carboxymethylation, cationisation, hydroxyethylation, esterification, cross-linking, hydrophobic starch, hydrolysis, oxidation, physical modification and enzymatic conversion. the second part is concerned with pre-cooked starches discussing chemical derivatisation, physical modification and reactions at low temperatures. Then granule swelling inhibitors in derivatisation and their side effects are explained. This is followed by information on amylose inclusion complexes, synergistic effects, carbohydrate oxidation with oxygen varieties on the Spengler and Pfannstiel reactions, spacers and the phosphate group in sugar and starch phosphates as nucleophiles Starch and cellulose acetoacetylation is described. Derivatisation with mixed anhydride and with alkyl sulfates is discussed. The reagent cyanamide which can be prepared by heating calcium carbide in nitrogen to temperatures over 1000 °C and can be extracted from calcium cyanamide with water is also discussed. Urea is used as a fertilizer, feed additive and in urea formaldehyde resins and is produced by heating liquid ammonia and carbon dioxide under pressure. Urea and starch derivatisation is explained. Starch and sugar derivatives with amidoxime and hydroxamic acids are detailed and ester

migration in carbohydrates. Then the book details about ferulic acid esters, which are found in pectin, gallic acid esters, which are present in tannins and lactic acid esters. Super absorbents can be used in hygienic pads, moisturising soil, coating of seeds and in medical applications are also discussed in this book. Enzymes are used in starch derivatisation and the applications of hydrolases, transferases, lyases, oxidoreductases, isomerases and peroxidases are explained. Oligosaccharides, raffinose, lactosucrose and oligosaccharide phosphates are also discussed in this book.

Overall equations, diagrammatic explanations and graphs have been used supporting the text. This book would be useful to any persons studying starch derivatisation and persons working in industry researching in this field.

John F. Kennedy\*

Rajdeep K. Sandhu

*Chembiotech Laboratories, Institute of Research & Development, University of Birmingham Research Park, Vincent Drive, Birmingham B15 2Q4, UK*

Available online 2 February 2006

---

\* Corresponding author

doi:10.1016/j.carbpol.2005.09.014

---

**Luc A. Cynober (Ed.), Metabolic and Therapeutic Aspects of Amino Acids in Clinical Nutrition, CRC Press LLC, Florida, USA, 2004 (755 pp., £, ISBN 0-8493-1382-1)**

For a healthy human diet amino acids are essential, especially leucine, lysine and threonine. Amino Acids play major roles in protein synthesis, gluconeogenesis, ureagenesis and cell metabolism in which amino acids act as regulators. *Metabolic and Therapeutic Aspects of Amino Acids in Clinical Nutrition* is split into five parts and then further split into chapters and areas covered in the book include physiology and physiopathology (amino acid metabolism), amino acid metabolism in disease, requirements and supply of amino acids and supply of amino acids in diseases.

*Metabolic and Therapeutic Aspects of Amino Acids in Clinical Nutrition* begins with an introduction providing general information about research carried out on amino acids and gives an overview of some of the information found in the rest of the book.

Part one gives an introduction to metabolism of amino acids, and explains how the concentration of amino acids can be measured in biological fluids and tissues, such as the blood and urine, using ion exchange chromatography and reversed-phase HPLC methods. Details are given about the different approaches to studying amino acid metabolism. In which plasma amino acid concentrations and the significance of their variations, measurement of arteriovenous differences, use of

stable isotopes to assess amino acid metabolism, whole body protein kinetics and protein metabolism in specific tissues are discussed. Cells take up amino acids, how they do this also explained. Amino acids are the building blocks for protein synthesis and play vital roles in neurotransmission, production and storage of metabolic energy, nitrogen metabolism and synthesis of hormones, purine and pyrimidine nucleotides, and glutathione.

Part two concentrates on physiology and section A focuses on metabolism and details amino acid metabolism, gluconeogenesis and ketogenesis from amino acids. ureagenesis and ammoniogenesis are explained. Regulation of carbonyl-phosphate synthase, transport of ornithine, citrulline and Aspartate across the mitochondrial membrane, urea synthesis and pH homeostasis, the periportal/pericentral glutamine cycle, metabolite channelling and urea synthesis, interaction of fatty acids with amino acids metabolism and glucose with urea synthesis, cell hydration and urea synthesis are discussed. Branched-chain amino acids metabolism is also described. Followed by details on the glutamate crossway, arginine and glutamine metabolism. Section B is titled 'Control of and by amino acids' which details the physiological role of insulin and amino acid catabolism and protein turnover. How metabolism of amino acids is controlled by counter regulatory hormones is discussed, where plasma concentration of amino acid, muscle free amino acids and protein metabolism are explained. Nitric oxide, the biology, physiology and pathophysiology is all presented in great detail. The actions of glucose and fat on protein metabolism, mechanisms of nitrogen sparing by glucose and lipids and effects of ketone bodies and fatty acid chain length on amino acid metabolism are all explained. Followed by details on signalling of amino acids and the control of protein synthesis, which is followed by explaining the control of proteolysis. the anabolic effects and signalling pathways triggered by amino acids in the liver are detailed. The immune system protects the body from pathogenic invaders, immune function and amino acids are discussed and how amino acids can stimulate insulin secretion.

Part three is concerned with amino acid metabolism in disease and discusses the effect of cancer on metabolism of proteins and amino acids, the effects on protein and amino acid metabolism by diabetes mellitus, acidosis, age-related scaropenia, gastrointestinal and liver disease is also discussed.

Part four explains the requirements of amino acids and is concerned with the importance of amino acids in adults, the neonatal requirements, in the elderly and in sport.

Part five is concerned with the supply of amino acids in diseases. Section A focuses on the qualitative and quantitative aspects. The amino acid intake by the parental route, nitrogen supply in enteral nutrition, branched-chain amino and keto acids in renal failure, enteral nutrition and glutamine-supplemented diets are all discussed. The uses of arginine in clinical practice are described well. Glutamine, a major element of amino acids and glutamine containing dipeptides are all discussed. The physical and chemical properties of ornithine  $\alpha$ -ketoglutarate and action of ornithine

$\alpha$ -ketoglutarate in surgical and trauma patients is discussed and the mechanism of ornithine  $\alpha$ -ketoglutarate action is also explained. The need of amino acids in patients with catabolic illnesses are explained. Sulphur containing-amino acids, most important being Methionine, cysteine and taurine, and glutathione, their metabolism is described in health and disease then further is discussed their supply in diseases. There is a requirement of amino acids in cancer, the growth of the tumour and how it effects the plasma acid profile and nutritional therapy in cancer patients is all discussed. The book explains acute renal failure and amino acid solutions for it. amino acids support gut function and morphology and these are discussed for in the mucosa, immune system and vasculature. Section C is concerned with nutraceuticals and discusses cardiovascular diseases and L-arginine-enriched diets, the biochemical aspects are explained. Then finally taurine homeostasis and its importance for physiological functions are explained.

In conclusion the book explains excellently the metabolism of amino acids and discusses it for different health and nutritional conditions. This book will be found very useful for persons carrying out research in this field.

Rajdeep K. Sandhu

John F. Kennedy\*

*Chembiotech Laboratories, Institute of Research & Development, University of Birmingham, Research Park, Birmingham B15 2Q5, UK*

Available online 2 February 2006

---

\* Corresponding author

doi:10.1016/j.carbpol.2005.09.013

---

**A. van Amerongen, D. Barug, M. Lauwaars, Rapid Methods for Biological and Chemical Contaminants in Food and Feed, Wageningen Academic Publishers, The Netherlands, 2005 (416pp., €85, ISBN 9076998531)**

Food and feed safety is extremely important and rapid methods ensure that safety is achieved and play an important role in microbiological and chemical applications in a food industry. Rapid methods allow quick analysis of food and feed and can be used in detection of unwanted organisms in food.

*Rapid Methods; for Biological and Chemical Contaminants in Food and Feed* opens with explaining why rapid testing is used. Rapid tests are fast, cheap and easy methods to use. A number of microbial pathogens can appear in food products, rapid testing can detect these microbial pathogens and quantify them. Chemical hazards can appear in the food-supply chain, rapid tests can be used to detect these too. Rapid tests are used often in the food industry in the identification of veterinary drug remains in milk, meat and eggs. The markets