

# NEW CHEMICAL RECYCLING TECHNOLOGY FOR POLYESTER FIBERS

## NEW Technology based on BHET method

### New Depolymerization Catalyst



- Quality equivalent to petroleum-derived polyester raw materials
- Lower environmental load



## Conventional Technology based on DMT method



Notes:

PET: PET bottles, polyester fibers, etc.

BHET: bis(2-hydroxyethyl) terephthalate

DMT: Dimethyl terephthalate

Transesterification: A reaction in which the main chain parts are exchanged when the ester and alcohol are reacted.

BHET is reacted with methanol to obtain DMT, and DMT is reacted with ethylene glycol to obtain BHET.



# Polyester Fibres Chemistry And Technology

**Rose Sinclair**



## **Polyester Fibres Chemistry And Technology:**

**Polyester Fibres; Chemistry and Technology** Hermann Ludewig, 1971  
Ludewig, Werner Roth, 1964      **Polyester Fibres** Hermann Ludewig, 1971      **Polyester Fibres** Hermann  
Polyesters and Polyamides B L Deopura, R  
Alagirusamy, M Joshi, B Gupta, 2008-06-17 Polyesters and polyamides remain the most used group of synthetic fibres This  
authoritative book reviews methods of their production ways of improving their functionality and their wide range of  
applications The first part of the book describes raw materials and manufacturing processes including environmental issues  
Part two considers ways of improving the functionality of polyester and polyamide fibres including blending weaving  
coloration and other finishing techniques as well as new techniques such as nanotechnology The final part of the book  
reviews the range of uses of these important fibres from apparel and sportswear to automotive medical and civil engineering  
applications With its distinguished editors and international team of contributors Polyesters and polyamides is a standard  
reference for all those using this important group of fibres Reviews the chemical and physical properties of each fibre and  
their manufacture Analyses how the functionality of polyester and polyamides can be improved Provides examples of how the  
fibres are used in applications      **Physico-chemical Aspects of Textile Coloration** Stephen M. Burkinshaw, 2016-02-08  
The production of textile materials comprises a very large and complex global industry that utilises a diverse range of fibre  
types and creates a variety of textile products As the great majority of such products are coloured predominantly using  
aqueous dyeing processes the coloration of textiles is a large scale global business in which complex procedures are used to  
apply different types of dye to the various types of textile material The development of such dyeing processes is the result of  
substantial research activity undertaken over many decades into the physico chemical aspects of dye adsorption and the  
establishment of dyeing theory which seeks to describe the mechanism by which dyes interact with textile fibres Physico  
Chemical Aspects of Textile Coloration provides a comprehensive treatment of the physical chemistry involved in the dyeing  
of the major types of natural man made and synthetic fibres with the principal types of dye The book covers fundamental  
aspects of the physical and chemical structure of both fibres and dyes together with the structure and properties of water in  
relation to dyeing dyeing as an area of study as well as the terminology employed in dyeing technology and science  
contemporary views of intermolecular forces and the nature of the interactions that can occur between dyes and fibres at a  
molecular level fundamental principles involved in dyeing theory as represented by the thermodynamics and kinetics of dye  
sorption detailed accounts of the mechanism of dyeing that applies to cotton and other cellulosic fibres polyester polyamide  
wool polyacrylonitrile and silk fibres non aqueous dyeing as represented by the use of air organic solvents and supercritical  
CO<sub>2</sub> fluid as alternatives to water as application medium The up to date text is supported by a large number of tables figures  
and illustrations as well as footnotes and widespread use of references to published work The book is essential reading for  
students teachers researchers and professionals involved in textile coloration      **Handbook of Tensile Properties of**

**Textile and Technical Fibres** A. R. Bunsell, 2009-10-19 Fibres usually experience tensile loads whether they are used for apparel or technical structures Their form which is long and fine makes them some of the strongest materials available as well as very flexible This book provides a concise and authoritative overview of tensile behaviour of a wide range of both natural and synthetic fibres used both in textiles and high performance materials After preliminary chapters that introduce the reader to tensile properties failure and testing of fibres the book is split into two parts Part one examines tensile properties and failure of natural fibres such as cotton hemp wool and silk Part two discusses the tensile properties and failure of synthetic fibres ranging from polyamide polyester and polyethylene fibres to carbon fibres Many chapters also provide a general background to the fibre including the manufacture microstructure factors that affect tensile properties as well as methods to improve tensile failure With its distinguished editor and array of international contributors Handbook of tensile properties of textile and technical fibres is an important reference for fibre scientists textile technologists and engineers as well as those in academia Provides an overview of tensile behaviour of a wide range of both natural and synthetic fibres Examines tensile characteristics tensile failure of textiles fibres and factors that affect tensile properties Discusses microstructures and each type of fibre from manufacture to finished product **Manufactured Fibre**

**Technology** V.B. Gupta, V.K. Kothari, 1997-10-31 Manufactured Fibre Technology provides an accessible and comprehensive treatment of the chemical physical and mechanical processes involved in the production of all important commodity manufactured fibres and most of the industrial fibres The emphasis is on the fundamental principles and industrial aspects of production Latest developments in manufactured fibres in terms of manufacturing processes characteristics and their applications are also covered Manufactured Fibre Technology is designed around twenty chapters with a balance of basic principles and production of specific fibre types Newer and industrially relevant areas such as high speed spinning production of speciality fibres including microfibres computer simulation of spinning high performance fibres spun bonding and melt blowing and re use of fibre waste are included The structure property and application areas of each fibre type are also discussed thus providing a broad understanding of the subject In addition various aspects related to the testing and characterisation of fibres and polymers are reviewed This book is an invaluable resource to students lecturers industrial technologists and researchers in this subject area **Modern Polyesters** John Scheirs, Timothy E. Long, 2005-09-01

Provides an overview of the family of polyester polymers which comprise an important group of plastics that span the range of commodity polymers to engineering resins It describes the preparation properties and applications of polyesters Readers will also find details on polyester based elastomers biodegradable aliphatic polyester liquid crystal polyesters and unsaturated polyesters for glass reinforced composites Presents an overview of the most recent developments Explores synthesis catalysts processes properties and applications Looks at emerging polyester materials as well as existing ones Written by foremost experts from both academia and industry ensuring that both fundamentals and practical applications are

covered *Polyester* Hosam El-Din M. Saleh,2012-09-26 Polyesters are being widely applied in different fields of life due to their excellent characteristics A book Polyester comprises 16 chapters covering synthesis characterization and applications of polyester Chemical and biological methods for synthesis of polyester were one of the most important points of research added Mechanical physical chemical characterizations and improvement of polyester were also explored Some aspects of applications in immobilization of radioactive wastes coating of aluminum alloys used in aircraft fabrics manufacturing and the development of the new composites were covered emphasising vast possibilities of implementation of that polymer This book should serve as a support to many scientists researchers and students as well as to other experts both in academia and industry *Handbook of Fiber Chemistry* Menachem Lewin,2006-11-15 The Handbook of Fiber Chemistry Third Edition provides complete coverage of scientific and technological principles for all major natural and synthetic fibers Incorporating new scientific techniques instruments characterization and processing methods the book features important technological advances from the past decade particularly *Handbook of Properties of Textile and Technical Fibres* A. R. Bunsell,2018-01-02 Handbook of Properties of Textile and Technical Fibres Second Edition introduces tensile properties and failure and testing of fibers also examining tensile properties and the failure of natural fibers such as cotton hemp flax agave wool and silk Next the book discusses the tensile properties and failure of synthetic fibers ranging from polyamide polyester polyethylene and carbon fibers Chapters provide a general background of the fiber including its manufacture microstructure factors that affect tensile properties and methods to improve tensile failure With its distinguished editor and international contributors this book is an important reference for fiber scientists textile technologists engineers and academics Offers up to date coverage of new and advanced materials for the fiber and textile industries Reviews structure property relationships of high performance natural synthetic polymer and inorganic fibers Offers a range of perspectives on the tensile properties of fibers from an international team of authors with diverse expertise in academic research and in textile development and manufacture Process Control in Textile Manufacturing Abhijit Majumdar,Apurba Das,R Alagirusamy,V K Kothari,2012-11-27 Complex raw materials and manufacturing processes mean the textile industry is particularly dependent on good process control to produce high and consistent product quality Monitoring and controlling process variables during the textile manufacturing process also minimises waste costs and environmental impact Process control in textile manufacturing provides an important overview of the fundamentals and applications of process control methods Part one introduces key issues associated with process control and principles of control systems in textile manufacturing Testing and statistical quality control are also discussed before part two goes on to consider control in fibre production and yarn manufacture Chapters review process and quality control in natural and synthetic textile fibre cultivation blowroom carding drawing and combing Process control in ring and rotor spinning and maintenance of yarn spinning machines are also discussed Finally part three explores process control in the manufacture of knitted woven nonwoven textiles and colouration

and finishing with a final discussion of process control in apparel manufacturing With its distinguished editors and international team of expert contributors Process control in textile manufacturing is an essential guide for textile engineers and manufacturers involved in the processing of textiles as well as academic researchers in this field Provides an important overview of the fundamentals and applications of process control methods Discusses key issues associated with process control and principles of control systems in textile manufacturing before addressing testing and statistical quality control Explores process control in the manufacture of knitted woven nonwoven textiles and colouration and finishing with a discussion on process control in apparel manufacturing , **The International Dyer, Textile Printer, Bleacher and Finisher** ,1978 Includes supplement for 1977 called International dyer export *Encyclopedia of Plasma Technology - Two Volume Set* J. Leon Shohet,2016-12-12 Technical plasmas have a wide range of industrial applications The Encyclopedia of Plasma Technology covers all aspects of plasma technology from the fundamentals to a range of applications across a large number of industries and disciplines Topics covered include nanotechnology solar cell technology biomedical and clinical applications electronic materials sustainability and clean technologies The book bridges materials science industrial chemistry physics and engineering making it a must have for researchers in industry and academia as well as those working on application oriented plasma technologies Also Available Online This Taylor E mail e reference taylorandfrancis.com International Tel 44 0 20 7017 6062 E mail online sales tandf.co.uk *Thermal Analysis of Textiles and Fibers* Michael Jaffe,Joseph D. Menczel,2020-03-22 Thermal Analysis of Textiles and Fibers offers systematic and comprehensive coverage of the subject from the principles of fiber structure and established TA methods to advanced TA techniques and their application to high performance fibers and textiles Thermal analysis is a convenient method for assessing fiber and fabric performance as monitored under end use relevant conditions Expertise in this field requires knowledge of both TA methods and of fiber behavior information that is brought together in this new volume In recent years thermal analysis has been applied to a variety of novel and high performance fibers such as Kevlar Vectran PBI polyolefins polypropylene PAN and PVA amongst others TA techniques are also used in fiber identification characterization and stability testing and may be combined with spectroscopic techniques to yield still more information about fiber properties Includes chapters on novel and high performance fibers that are used in assembling technical textiles Covers advanced TA methods such as combined and modulated techniques Brings together focused information on TA for fibers and textiles that is not otherwise available in a single volume [Handbook of Textile Fibre Structure](#) Stephen Eichhorn,J. W. S. Hearle,M Jaffe,T Kikutani,2009-10-19 Due to their complexity and diversity understanding the structure of textile fibres is of key importance This authoritative two volume collection provides a comprehensive review of the structure of an extensive range of textile fibres Volume 1 begins with an introductory set of chapters on fibre structure and methods to characterise fibres The second part of the book covers the structure of manufactured polymer fibres such as polyester polyamides polyolefin elastomeric and aramid fibres as well

as high modulus high tenacity polymer fibres Chapters discuss fibre formation during processing and how this affects fibre structure and mechanical properties A companion volume reviews natural regenerated inorganic and specialist fibres Edited by leading authorities on the subject and with a team of international authors the two volumes of the Handbook of textile fibre structure is an essential reference for textile technologists fibre scientists textile engineers and those in academia The first title of a authoritative two volume collection that provides a comprehensive review of the structure of a range of textile fibres Provides an overview of the development of fibre structure and methods to characterise fibres Examines the structure of both traditional and new fibres and natural and manufactured fibres

### **Photochemical Reactions in Heterochain**

**Polymers** F. Niyazi, 2008 Photochemical reactions are the main class of chemical processes These processes provide for life on Earth since due to photochemical processes plants absorb carbon dioxide from the atmosphere changing them into the meal for all creatures on Earth Together with good photochemical processes there are some bad as well This book is about photodestruction and light stabilisation and is devoted to these processes For example the heterochain polymers They are the main class of large tonnage polymers which are used for making a great variety of polymer and composite materials including nanocomposites

Textiles and Fashion Rose Sinclair, 2014-11-08 This major textbook is designed for students studying textiles and fashion at higher and undergraduate level as well as those needing a comprehensive and authoritative overview of textile materials and processes The first part of the book reviews the main types of natural and synthetic fibres and their properties Part two provides a systematic review of the key processes involved first in converting fibres into yarns and then transforming yarns into fabrics Part three discusses the range of finishing techniques for fabrics The final part of the book looks specifically at the transformation of fabric into apparel from design and manufacture to marketing With contributions from leading experts in their fields this major book provides the definitive one volume guide to textile manufacture Provides comprehensive coverage of the types and properties of textile fibres to yarn and fabric manufacture fabric finishing apparel production and fashion Focused on the needs of college and undergraduate students studying textiles or fashion courses Each chapter ends with a summary to emphasise key points a comprehensive self review section and project ideas are also provided

**Handbook of Fiber Chemistry, Second Edition, Revised and Expanded** Menachem Lewin, Eli M. Pearce, 1998-02-26 Offers comprehensive coverage of the most important natural and synthetic fibers used in consumer goods agriculture industry medicine and engineering Second Edition provides entirely new coverage of topics such as vinyl fibers mammalian fibers related to wool cotton jute silk and kenaf fibers and acrylic fibers

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