# Retention of Fines and Fillers During Papermaking

Jerome M. Gess Editor

# **Retention Of Fines And Fillers During Papermaking**

**Gennady Zaikov** 

# **Retention Of Fines And Fillers During Papermaking:**

Retention of Fines and Fillers During Papermaking Jerome M. Gess. 1998 **Encyclopedia of Surface and Colloid** Handbook of Pulping and Papermaking Christopher J. Biermann, 1996-08-01 In its **Science** P. Somasundaran, 2006 Second Edition Handbook of Pulping and Papermaking is a comprehensive reference for industry and academia The book offers a concise yet thorough introduction to the process of papermaking from the production of wood chips to the final testing and use of the paper product The author has updated the extensive bibliography providing the reader with easy access to the pulp and paper literature The book emphasizes principles and concepts behind papermaking detailing both the physical and chemical processes A comprehensive introduction to the physical and chemical processes in pulping and papermaking Contains an extensive annotated bibliography Includes 12 pages of color plates The local distribution of fillers in the z-direction of paper Christian Rompf, 2014-04-11 Inhaltsangabe Introduction It is important to determine the distribution fillers in thickness direction of paper However the techniques that are available are limited in precision and accuracy This thesis describes a new method for the determination of fillers in the z direction of paper The method is based on a splitting technique that offers a good reproducibility and provides good layer uniformity. The new method is used to estimate the effects of different factors of influences affecting the fillers distribution During sheet forming a large amount of water is removed. This dewatering process creates an irregular distribution of fillers across the thickness of the paper Therefore the description of the distribution of fillers in the thickness direction is critical to optimize paper properties The techniques currently available for this kind of characterization have limitations in terms of repeatability resolution or precision Another limitation to currently available techniques is the lack of a good sampling area Considering the large effect of fillers on many paper properties the ability to measure and thus control the filler distribution in the z direction helps to control sheet structure reduce two sidedness and improve paper properties such as internal bond Inhaltsverzeichnis Table of Contents Acknowledgements Abstract Index of contents 1 Introduction 1 1 Paper structure 7 1 1 1 Three dimensional network8 1 1 2Formation11 1 2Fillers12 1 2 1Effects of filler loading on the properties of paper12 1 2 2The main fillers 14 1 3Retention and dewatering 16 1 3 1 First pass retention and true retention 17 1 3 2 Agglomeration and flocculation 20 1 3 3Retention fundamentals 23 1 3 4Filler distribution 24 1 4Measuring filler content and distribution 25 2 Materials and methods 28 2 1 1 Measuring filler distribution 28 2 1 2 The procedure of splitting 33 2 1 3 Acquisition of the images 35 3 Results and Discussion 37 3 1Settings of the scanner 38 3 2Different backgrounds 40 3 3Repeatability of the method 42 3 4Influence of the position of filler addition 43 3 5SC Paper with 42 8 % GCC53 3 6TMP Paper 20% GCC57 3 7Fine paper with 20 % and 30 % of GCC63 3 8Different positions of adding GCC73 4 Summary83 5 Sources84 6 List of Figures86 Textprobe Text Sample Chapter 1 3 4 Filler distribution The distribution of filler material in the paper depends on the forming process Fillers can be entrapped mechanically into the web **TAPPI Pulping Conference, 1999 Proceedings**, 1999 Chemistry of Modern

Papermaking Cornel Hagiopol, James W. Johnston, 2011-09-08 Chemistry of Modern Papermaking presents a chemist s perspective on the papermaking process With roughly 3% of the mass of a paper product invested in water soluble chemicals paper makers can adjust the speed and efficiency of the process minimize and reuse surplus materials and differentiate a paper product as required by specific customers W Applications of Wet-End Paper Chemistry Che On Au, I. Thorn, 2013-06-29 Commercial demands and increasing global competition have led to enormous mechanical evolution over recent years Twin wires wide nip presses steam boxes and speed sizers have all played a part in improving both the productivity and quality of paper and board products With the emphasis on mechanical and electrical engineering and the ever increasing pressures of quality measurement and control little time has been available within a technical department for much reflection on the chemistry of the process Thus there is a growing trend for the management of the wet end to be delegated to the chemical supplier The advances in scale of paper manufacture environmental sensitivity and higher quality of end product requirements have all had an impact on the chemistry of the wet end The increased production means for example that down time is more of an anathema now when capacity is critical Similarly with the greater rigours of quality management anything which causes breaks or holes must be eradicated Environmental pressures too are growing on the papermaking process Even if consideration is restricted to only the closure of the white water circuit it alone throws down a challenge to the potency of biocides retention aids and other chemicals These chemicals are detriment ally affected by an increasing concentration of water soluble pulp extractives and surfactants adhesives and polysaccharides from broke and Applications of Wet-End Paper Chemistry Ian Thorn, Che On Au, 2009-07-24 Applications of Wet end Paper recycled paper Chemistry bridges the gap between the theory and practice of wet end paper chemistry by explaining how particular chemicals are chosen and put to use in real situations A number of international experts in the field present recent contributions on the optimum use of chemicals in papermaking Major inroads have taken place since the first edition of this title was published in 1995 This new edition of Applications of Wet end Paper Chemistry will reflect the changing type and use of chemicals used in papermaking in the 21st century Chemists and chemical engineers across the paper and pulp making industry as well as in research and academic institutes will find this book of enormous practical value Journal ,2001-06 Paper Chemistry and Technology Monica Ek, Göran Gellerstedt, Gunnar Henriksson, 2009-12-15 This four volume set covers the entire spectrum of pulp and paper chemistry and technology from starting material to processes and products including market demands This work is essential for all students of wood science and a useful reference for those working in the pulp and paper industry or on the chemistry of renewable resources Volume 3 provides an overview of paper production and the ways in which the chemistry of starting materials and processes influence its quality and properties The work treats fundamental properties of the fibre wall and the consolidation of fibres during pressing and drying surface chemistry of fibres and their influence on the interaction between fibres paper and other materials mechanisms behind the

adsorption of polyelectrolytes to fibres and fillers acid and alkaline sizing of paper basic fluid mechanical behavior of fibre suspensions web forming web pressing and web drying in a modern paper machine calandering and coating of paper

Biermann's Handbook of Pulp and Paper Pratima Bajpai, 2018-05-17 Biermann's Handbook of Pulp and Paper Paper and Board Making Third Edition provides a thorough introduction to paper and board making providing paper technologists recent information The book emphasizes principles and concepts behind papermaking detailing both the physical and chemical processes It has been updated revised and extended Several new chapters have been added Papermaking chemistry has found an adequate scope covering this important area by basics and practical application Scientific and technical advances in refining including the latest developments have been presented. The process of stock preparation describes the unit processes An exhaustive overview of Chemical additives in Pulp and Paper Industry is included Paper and pulp processing and additive chemicals are an integral part of the total papermaking process from pulp slurry through sheet formation to effluent disposal Water circuits with loop designs and circuit closure are presented. The chapter on paper and board manufacture covers the different sections in the paper machine and also fabrics rolls and roll covers and describes the different types of machines producing the various paper and board grades Coating is dealt with in a separate chapter covering color formulation and preparation and also coating application Paper finishing gives an insight into what happens at roll slitting and handling The chapter on environmental impact includes waste water treatment and handling air emissions utilization and solid residue generation and mitigation The major paper and board grades and their properties are described Biotechnological methods for paper processing are also presented This handbook is essential reading for Applied Chemists Foresters Chemical Engineers Wood Scientists and Pulp and Paper technologist Engineers and anyone else interested or involved in the pulp and paper industry Provides comprehensive coverage on all aspects of papermaking Covers the latest science and technology in papermaking Includes traditional and biotechnological methods a unique feature of this book Presents the environmental impact of papermaking industries Sets itself apart as a valuable reference that every pulp and papermaker engineer chemist will find extremely useful Water-Soluble Polymers N. Bikales, 2013-11-21 Water soluble polymers have been attracting increasing attention because of their utility in industrial applications of great current concern Perhaps preeminent among these is their ability to flocculate suspended solids e g wastes in municipal sew age treatment plants or pulp in papermaking other important appli cations are to aid in so called secondary recovery of petroleum to reduce turbulent friction of water and as components of water based finishes developed in response to environmental con straints Some water soluble polymers have shown interesting bio logic activity which is being investigated further This book is based on papers presented at a symposium held by the American Chemical Society Division of Organic Coatings and Plastics Chemistry in New York City on 30 31 August 1972 The large attendance and the favorable response of the audience con firmed not only our view of the importance of the field but also the need to bring these topics together The chapters in this

book are generally enlarged and more detailed with more complete bibliographies than the papers presented at the Symposium They include not only the important applications described above but also descriptions of new syntheses and characterization methods Advances in Chitin/Chitosan Characterization and Applications Marguerite Rinaudo, Francisco M. Goycoolea, 2019-04-23 Functional advanced biopolymers have received far less attention than renewable biomass cellulose rubber etc used for energy production Among the most advanced biopolymers known is chitosan The term chitosan refers to a family of polysaccharides obtained by partial de N acetylation from chitin one of the most abundant renewable resources in the biosphere Chitosan has been firmly established as having unique material properties as well as biological activities Either in its native form or as a chemical derivative chitosan is amenable to being processed typically under mild conditions into soft materials such as hydrogels colloidal nanoparticles or nanofibers Given its multiple biological properties including biodegradability antimicrobial effects gene transfectability and metal adsorption to name but a few chitosan is regarded as a widely versatile building block in various sectors e g agriculture food cosmetics pharmacy and for various applications medical devices metal adsorption catalysis etc This Special Issue presents an updated account addressing some of the major applications including also chemical and enzymatic modifications of oligos and polymers A better understanding of the properties that underpin the use of chitin and chitosan in different fields is key for boosting their more extensive industrial utilization as well as to aid regulatory agencies in establishing specifications guidelines and standards for the different types of products and applications Handbook of Paper and Board Herbert Holik, 2013-03-25 Papermaking is a fascinating art and technology The second edition of this successful 2 volume handbook provides a comprehensive view on the technical economic ecologic and social background of paper and board It has been updated revised and largely extended in depth and width including the further use of paper and board in converting and printing A wide knowledge basis is a prerequisite in evaluating and optimizing the whole process chain to ensure efficient paper and board production. The same is true in their application and end use The book covers a wide range of topics Raw materials required for paper and board manufacturing such as fibers chemical additives and fillers Processes and machinery applied to prepare the stock and to produce the various paper and board grades including automation and trouble shooting Paper converting and printing processes book preservation The different paper and board grades as well as testing and analysing fiber suspensions paper and board products and converted or printed matters Environmental and energy factors as well as safety aspects The handbook will provide professionals in the field e g papermakers as well as converters and printers laymen students politicians and other interested people with the most up to date and comprehensive information on the state of the art techniques and aspects involved in paper making converting and printing Chemistry of Polysaccharides Gennady Zaikov, 2005-04-18 This monograph summarizes scientific achievements in the field of polysaccharide chemistry performed in the last decade For the first time the particular features of polysaccharide structure physical chemical properties and

biochemical transformations in their interrelations are considered as well as the questions of polysaccharide modification along the whole hierarchical chain including starch mono di oligo and polysaccharides chitin chitozan and cellulose Polysaccharide interactions with diverse solvents and low molecular macrocyclic and high molecular substances in solutions are scrutinized Several aspects of mechanical chemical modification of polysaccharides in solid state and in gel are observed Modern concepts of enzyme degradation of polysaccharides and technologies of natural polymers processing are analyzed The book is intended for wide range of readers students post graduates engineers and scientists engaged in polymer Cellulose Abu Zahrim Yaser, Mohd Sani Sarjadi, Junidah Lamaming, 2023-09-26 chemistry organic and physical chemistry Cellulose Development Processing and Applications covers topics related to advanced cellulose development and processing as well as the utilization of major agricultural and biomass waste It discusses the utilization of cellulose from other agricultural and biomass materials including oil palm biomass bamboo and other non wood forest products in emerging areas It covers the treatments used to improve the quality of cellulosic materials in specific applications Following that the book delves into the use of cellulosic materials in the application of composting science and technology Features Delves into the specific agriculture waste biomass waste materials used for the advanced cellulose based production Outlines the potential use of the covered materials for energy production and other emerging applications Includes composting technology and processes using the cellulosic materials Overviews industrial applications of cellulose from agricultural waste biomass waste and composting technology Discusses the main agricultural waste biomass in the Asian region This book is aimed at researchers and graduate students in chemical engineering bioprocessing composites and biotechnology **Iournal** of Pulp and Paper Science, 2007 Lignocellulosic Fibers and Wood Handbook Mohamed Naceur Belgacem, A. Pizzi, 2016-04-05 This book will focus on lignocellulosic fibres as a raw material for several applications. It will start with wood chemistry and morphology Then some fibre isolation processes will be given before moving to composites panel and paper manufacturing characterization and aging Official Gazette of the United States Patent and Trademark Office United States. Patent and Trademark Office, 2001 Official Gazette of the United States Patent Office United States. Patent Office, 1969

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