

# Basic Principles of Membrane Technology

second edition

Marcel Mulder



Springer

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# Solution Basic Principles Membrane

**Lingjun Ying**



## **Solution Basic Principles Membrane:**

*Basic Principles of Membrane Technology* Marcel Mulder, 2012-12-06 III 2 Preparation of synthetic membranes 72 III 3 Phase inversion membranes 75 III 3 1 Preparation by evaporation 76 III 3 2 Precipitation from the vapour phase 76 III 3 3 Precipitation by controlled evaporation 76 Thermal precipitation 76 III 3 4 III 3 5 Immersion precipitation 77 Preparation techniques for immersion precipitation 77 III 4 Flat membranes 77 III 4 1 78 III 4 2 Tubular membranes 81 III 5 Preparation techniques for composite membranes 82 III 5 1 Interfacial polymerisation Dip coating 83 III 5 2 III 5 3 Plasma polymerisation 86 III 5 4 Modification of homogeneous dense membranes 87 III 6 Phase separation in polymer systems 89 III 6 1 Introduction 89 III 6 1 1 Thermodynamics 89 III 6 2 Demixing processes 99 III 6 2 1 Binary mixtures 99 III 6 2 2 Ternary systems 102 III 6 3 Crystallisation 104 III 6 4 Gelation 106 III 6 5 Vitrification 108 III 6 6 Thermal precipitation 109 III 6 7 Immersion precipitation 110 III 6 8 Diffusional aspects 114 III 6 9 Mechanism of membrane formation 117 III 7 Influence of various parameters on membrane morphology 123 III 7 1 Choice of solvent nonsolvent system 123 III 7 2 Choice of the polymer 129 III 7 3 Polymer concentration 130 III 7 4 Composition of the coagulation bath 132 III 7 5 Composition of the casting solution 133 III 7

Basic Principles of Membrane Technology J. Mulder, 2013-04-18 Membranes play a central role in our daily life or as indicated by one of my foreign colleagues Richard Bowen If you are tired of membranes you are tired of life Biological membranes are hardly used in industrial applications but separations with synthetic membranes have become increasingly important Today membrane processes are used in a wide range of applications and their numbers will certainly increase Therefore there is a need for well educated and qualified engineers chemists scientists and technicians who have been taught the basic principles of membrane technology However despite the growing importance of membrane processes there are only a few universities that include membrane technology in their regular curricula One of the reasons for this may be the lack of a comprehensive textbook For me this was one of the driving forces for writing a textbook on the basic principles of membrane technology which provides a broad view on the various aspects of membrane technology I realise that membrane technology covers a broad field but nevertheless I have tried to describe the basic principles of the various disciplines Although the book was written with the student in mind it can also serve as a first introduction for engineers chemists and technicians in all kind of industries who wish to learn the basics of membrane technology

Membrane Processes in Biotechnology and Pharmaceuticals Catherine Charcosset, 2012-03-14 Chapter 1 Principles on membrane and membrane processes Chapter 2 Ultrafiltration Chapter 3 Microfiltration Chapter 4 Virus Filtration Chapter 5 Membrane chromatography Chapter 6 Membranes for the Preparation of Emulsions and Particles Chapter 7 Other Membrane Processes Chapter 8 Some Perspectives

**Fundamental principles and their application** Julius Stieglitz, 1911

**The Fundamental Principles of Chemistry** Wilhelm Ostwald, 1909

**A Handbook of Practical Treatment: General principles, physical methods, intoxications, blood, lymphatics & ductless glands** John Herr Musser, Aloysius Oliver

Joseph Kelly, Thomas Charles Kelly, 1911      **General Chemistry** Horace Grove Deming, 1925      *Materials Research* Zhong Wei Gu, Yafang Han, Fu Sheng Pan, Xitao Wang, Duan Weng, Shaoxiong Zhou, 2009-01-02 Eco environmental materials energy materials magnesium aerospace materials and biomaterials for medical application Selected peer reviewed papers from MRS International Materials Research Conference Science Technology Application Industry June 9 12 2008 Chongqing China

The New International Encyclopædia Frank Moore Colby, Talcott Williams, 1917      **The New International Encyclopaedia** Frank Moore Colby, Talcott Williams, 1929      *Bulletin - United States. Bureau of Soils* United States. Bureau of Soils, 1907      **New International Encyclopedia**, 1916      **Fundamental Principles of Bacteriology with Laboratory Exercises** Anthony Joseph Salle, 1939      The Journal of Physical Chemistry, 1920      **Reprints from the Departments of Chemistry and Chemical Engineering of the University of Michigan** University of Michigan. Department of Chemistry, 1921      The Journal of Physical Chemistry Wilder Dwight Bancroft, 1920 Includes section New Books      **The Laryngoscope**, 1907 A monthly journal on diseases of the ear nose throat      *Essentials of Physiology* Francis Arthur Bainbridge, 1929      **Plating and Surface Finishing**, 1981      *International Record of Medicine and General Practice Clinics* Edward Swift Dunster, Frank Pierce Foster, James Bradbridge Hunter, Charles Eucharist de Medicis Sajous, Gregory Stragnell, Henry J. Klaunberg, Félix Martí-Ibáñez, 1886

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