

PART I - TRANSPORT PROCESSES: MOMENTUM, HEAT, AND MASS

(1.2-1)

Eq. (1.3-4) $K = 353.2 = ^\circ\text{C} + 273.15$ $^\circ\text{C} = 80.05 = \boxed{80^\circ\text{C}}$

Eq. (1.3-2) $^\circ\text{C} = 80.0 = (1/1.8)(^\circ\text{F} - 32)$ $^\circ\text{F} = \boxed{176^\circ\text{F}}$

Eq. (1.3-3) $^\circ\text{R} = ^\circ\text{F} + 460 = 176 + 460$ $^\circ\text{R} = \boxed{636^\circ\text{R}}$

(1.2-2)

Eq. (1.3-2) $^\circ\text{C} = (1/1.8)(^\circ\text{F} - 32) = (1/1.8)(155 - 32) = \boxed{68.33^\circ\text{C}}$

Eq. (1.3-4) $K = ^\circ\text{C} + 273.15 = 68.33 + 273.15 = \boxed{341.5\text{ K}}$

Eq. (1.3-3) $^\circ\text{R} = ^\circ\text{F} + 460 = 155 + 460 = \boxed{615^\circ\text{R}}$

(1.3-1)

$MW(\text{O}_2) = 32.00, MW(\text{N}_2) = 28.02$
 $MW(\text{air}) = 0.21(32.00) + 0.79(28.02) = \boxed{28.9\text{ kg/kg mol}}$

(1.3-2)

$2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$ $MW \quad 28.01 \quad 32.00 \quad 44.01$ $Moles\text{ CO} = \frac{56.0\text{ kg}}{28.01\text{ kg/kg mol}} = 2.00\text{ kg mol}$

$Moles\text{ O}_2 = 1.00, 1.00(32.00) = \boxed{32.0\text{ kg O}_2}$ $2.00(44.0) = \boxed{88.0\text{ kg CO}_2}$

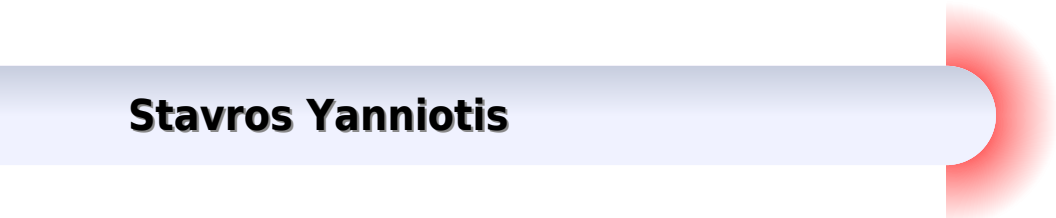
(1.3-3)

Gas	g	MW	g mol	Mol free
N ₂	20	28.02	0.7138	0.1648 mol free
O ₂	83	32.00	2.5938	0.5990
CO ₂	45	44.01	1.0225	0.2362
Total	148 g		4.3301 g mol	1.0000

Average mol wt = $\frac{148\text{ g}}{4.3301\text{ g mol}} = \boxed{34.2\text{ g/g mol}}$
 $\boxed{34.2\text{ kg/kg mol}}$

Geankoplis Transport Processes 4th Solutions Manual

Stavros Yanniotis



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PPI Mechanical Engineering Reference Manual, 14th Edition eText - 6 Months, 1 Year Michael R.

Lindeburg, 2019-12-30 Comprehensive Reference Manual for the NCEES PE Mechanical Exams The Mechanical Engineering Reference Manual is the most comprehensive textbook for the three NCEES PE Mechanical exams HVAC and Refrigeration Machine Design and Materials Thermal and Fluid Systems This book's time tested organization and clear explanations start with the basics to help you quickly get up to speed on common mechanical engineering concepts Together the 75 chapters provide an in depth review of the PE Mechanical exam topics and the NCEES Handbook Michael R Lindeburg's Mechanical Engineering Reference Manual has undergone an intensive transformation in this 14th edition to ensure focused study for success on the 2020 NCEES computer based tests CBT As of April 2020 exams are offered year round at approved Pearson Vue testing centers The only resource examinees can use during the test is the NCEES PE Mechanical Reference Handbook To succeed on exam day you need to know how to solve problems using that resource The Mechanical Engineering Reference Manual 14th Edition makes that connection for you by using only NCEES equations in the review and problem solving Topics Covered Fluids Thermodynamics Power Cycles Heat Transfer HVAC Statics Materials Machine Design Dynamics and Vibrations Control Systems Plant Engineering Economics Law and Ethics Key Features Improved design to focus study on most important PE exam material Explanations and demonstration of how to use NCEES handbook equations NCEES handbook equations are highlighted in blue for quick access In chapter callouts map to the specific PE exam to streamline review process Extensive index contains thousands of entries with multiple entries included for each topic Binding Hardcover Publisher PPI A Kaplan Company *Solutions Manual to Accompany Transport Processes and Unit Operations, Second Edition, and Transport Processes* Christie J. Geankoplis, 1983 Modeling, Analysis and Optimization of Process and Energy Systems F. Carl Knopf, 2011-12-14 Energy costs impact the profitability of virtually all industrial processes Stressing how plants use power and how that power is actually generated this book provides a clear and simple way to understand the energy usage in various processes as well as methods for optimizing these processes using practical hands on simulations and a unique approach that details solved problems utilizing actual plant data Invaluable information offers a complete energy saving approach essential for both the chemical and mechanical engineering curricula as well as for practicing engineers **Solving Problems in Food Engineering** Stavros Yanniotis, 2007-12-03 This easy to follow guide is a step by step workbook intended to enhance students understanding of complicated concepts in food engineering It also gives them hands on practice in solving food engineering problems The book covers problems in fluid flow heat transfer and mass transfer It also tackles the most common unit operations that have applications in food processing such as thermal processing cooling and freezing evaporation psychometrics and drying Included are theoretical questions in the form of true or false solved problems semi solved problems and problems solved using a computer The semi solved problems guide

students through the solution **Mass Transfer** A. P. SINHA,PARAMESWAR DE,2012-05-09 This book introduces the fundamental principles of the mass transfer phenomenon and its diverse applications in process industry It covers the full spectrum of techniques for chemical separations and extraction Beginning with molecular diffusion in gases liquids and solids within a single phase the mechanism of inter phase mass transfer is explained with the help of several theories The separation operations are explained comprehensively in two distinct ways stage wise contact and continuous differential contact The primary design requirements of gas liquid equipment are discussed The book provides a detailed discussion on all individual gas liquid liquid liquid solid gas and solid liquid separation processes The students are also exposed to the underlying principles of the membrane based separation processes The book is replete with real applications of separation processes and equipment Problems are worked out in each chapter Besides problems with answers short questions multiple choice questions with answers are given at the end of each chapter The text is intended for a course on mass transfer transport and separation processes prescribed for the undergraduate and postgraduate students of chemical engineering

Mechanical and Solid-Fluid Operations Subrata Kumar Majumder,2025-04-28 The text comprehensively discusses the transport mechanism storage and conveying of the material which are essential requirements for transporting solids in various process units especially in mineral and chemical industries It covers the properties of particles and particulate systems and focuses on their characterization and analysis This book Presents a discussion of theoretical principles coupled with illustrative examples to help readers learn how to operate optimize and innovate particle processing technologies Covers transport characterization of the solid fluid operations slurry physical properties and properties of particles Illustrates systematic and comprehensive understanding of fundamental phenomena of properties of particles and handling of particulate systems Explains graphical representation of particle size particle size measurement and particle size distribution Includes ancillary material such as numerical problems review questions multiple choice questions and exercises at the end of each chapter It is primarily written for senior undergraduates graduate students and academic researchers in fields including chemical engineering mechanical engineering environmental engineering industrial engineering manufacturing engineering and chemistry

Transport Processes and Separation Process Principles Christie John Geankoplis,Allen Hersel,Daniel H. Lepek,2018-05-02 The Complete Unified Up to Date Guide to Transport and Separation Fully Updated for Today s Methods and Software Tools Transport Processes and Separation Process Principles Fifth Edition offers a unified and up to date treatment of momentum heat and mass transfer and separations processes This edition reorganized and modularized for better readability and to align with modern chemical engineering curricula covers both fundamental principles and practical applications and is a key resource for chemical engineering students and professionals alike This edition provides New chapter objectives and summaries throughout Better linkages between coverage of heat and mass transfer More coverage of heat exchanger design New problems based on emerging topics such as biotechnology

nanotechnology and green engineering New instructor resources additional homework problems exam questions problem solving videos computational projects and more Part 1 thoroughly covers the fundamental principles of transport phenomena organized into three sections fluid mechanics heat transfer and mass transfer Part 2 focuses on key separation processes including absorption stripping humidification filtration membrane separation gaseous membranes distillation liquid liquid extraction adsorption ion exchange crystallization and particle size reduction settling sedimentation centrifugation leaching evaporation and drying The authors conclude with convenient appendices on the properties of water compounds foods biological materials pipes tubes and screens The companion website trine.edu/transport5ed contains additional homework problems that incorporate today's leading software including Aspen CHEMCAD MATLAB COMSOL and Microsoft Excel

British Books in Print, 1985 **Ceramic Membranes** Vitaly Gitis, Gadi Rothenberg, 2016-08-22 Ein wichtiges Lehrwerk für ein zunehmend wichtiges Fachgebiet gelungene Einführung prägnante Darstellung der Grundlagen der Membranseparation Überblick über Charakterisierungstechniken für keramische Membranen industrielle Anwendungen und deren Wirtschaftlichkeit **The British Library General Catalogue of Printed Books 1976 to 1982** British Library, 1983

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