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momentum; 5.5 Problems

CHAPTER 6. FLOW OF VISCOUS FLUID 6.1 Continuity equation; 6.2 Navier-Stokes equation; 6.3 Velocity distribution of laminar flow; 6.4 Velocity distribution of turbulent flow; 6.5 Boundary layer; 6.6 Theory of lubrication; 6.7 Problems; CHAPTER 7. FLOW IN PIPES; 7.1 Flow in the inlet region; 7.2 Loss by pipe friction; 7.3 Frictional loss on pipes other than circular pipes; 7.4 Various losses in pipe lines; 7.5 Pumping to higher levels; 7.6 Problems; CHAPTER 8. FLOW IN A WATER CHANNEL; 8.1 Flow in an open channel with constant section and flow velocity; 8.2 Best section shape of an open channel 8.3 Specific energy 8.4 Constant discharge; 8.5 Constant specific energy; 8.6 Constant water depth; 8.7 Hydraulic jump; 8.8 Problems; CHAPTER 9. DRAG AND LIFT; 9.1 Flows around a body; 9.2 Forces acting on a body; 9.3 The drag of a body; 9.4 The lift of a body; 9.5 Cavitation; 9.6 Problems; CHAPTER 10. DIMENSIONAL ANALYSIS AND LAW OF SIMILARITY; 10.1 Dimensional analysis; 10.2 Buckingham's π theorem; 10.3 Application examples of dimensional analysis; 10.4 Law of similarity; 10.5 Problems; CHAPTER 11. MEASUREMENT OF FLOW VELOCITY AND FLOW RATE; 11.1 Measurement of flow velocity 11.2 Measurement of flow discharge 11.3 Problems; CHAPTER 12. FLOW OF AN IDEAL FLUID; 12.1 Euler's equation of motion; 12.2 Velocity potential; 12.3 Stream function; 12.4 Complex potential; 12.5 Example of potential flow; 12.6 Conformal mapping; 12.7 Problems; CHAPTER 13. FLOW OF A COMPRESSIBLE FLUID; 13.1 Thermodynamical characteristics; 13.2 Sonic velocity; 13.3 Mach number; 13.4 Basic equations for one-dimensional compressible flow; 13.5 Isentropic flow; 13.6 Shock waves; 13.7 Fanno flow and Rayleigh flow; 13.8 Problems; CHAPTER 14. UNSTEADY FLOW; 14.1 Vibration of liquid column in U-tube 14.2 Propagation of pressure in pipe line

Sommario/riassunto

Fluid mechanics is often seen as the most difficult core subject encountered by engineering students. The problem stems from the necessity to visualise complex flow patterns and fluid behaviour modelled by high level mathematics. This text overcomes this difficulty by introducing the concepts through everyday examples, before moving on to the more involved mathematics. The various theories of flow have been correlated with real phenomena and, combined with numerous figures and photographs, help the reader place the subject in context. Examples from a broad range of engineering disciplines are

2. Record Nr.	UNINA9910146246303321
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Nota di contenuto	Microbial Transport Systems; Preface; Contents; List of Authors; Color Plates; 1 Families of Transporters: A Phylogenetic Overview; 1.1 Introduction; 1.2 The TC System; 1.3 The Value of Phylogenetic Classification; 1.4 Phylogeny as Applied to Transporters; 1.5 The Basis for Classification in the TC System; 1.6 Classes of Transporters; 1.7 Class 1: Channels/Pores; 1.8 Class 2: Electrochemical Potential-driven Porters; 1.9 Class 3: Primary Active Transporters; 1.10 Class 4: Group Translocators; 1.11 Class 8: Accessory Factors Involved in Transport 1.12 Class 9: Incompletely Characterized Transport Proteins1.13 Transporters with Dual Modes of Energy Coupling; 1.14 Transporters Exhibiting More than One Mode of Transport; 1.15 Conclusions and Perspectives; References; 2 Energy-transducing Ion Pumps in Bacteria : Structure and Function of ATP Synthases; 2.1 Introduction; 2.2 Overview; 2.3 Structure, Configuration, and Interaction of F(1) Subunits;

2.4 Catalysis: Structural and Mechanistic Implications within the F(1) Complex; 2.5 The F(1)/F(O) Interface: Contact Sites for Energy Transmission
2.6 Structure, Configuration, and Interaction of F(O) Subunits
2.7 Catalysis: Coupling Ion Translocation to ATP Synthesis; References; 3 Sodium/Substrate Transport; 3.1 Introduction; 3.2 Occurrence and Role of Na(+) /Substrate Transport Systems; 3.2.1 General Considerations; 3.2.2 Elevated Temperatures; 3.2.3 Na(+) -rich Environments; 3.2.4 High pH; 3.2.5 Citrate Fermentation; 3.2.6 Na(+) /Substrate Transport in Escherichia coli; 3.2.7 Osmotic Stress; 3.3 Functional Properties of Na(+) /Substrate Transport Systems; 3.3.1 General Considerations; 3.3.2 MelB; 3.3.3 PutP; 3.3.4 CitS
3.4 Transporter Structure
3.4.1 General Features; 3.4.2 MelB; 3.4.3 PutP and Other Members of the SSF; 3.4.4 CitS; 3.5 Structure -Function Relationships; 3.5.1 MelB; 3.5.1.1 Site of Ion Binding; 3.5.1.2 Sugar Binding and Functional Dynamics of MelB; 3.5.2 PutP; 3.5.2.1 Site of Na(+) Binding; 3.5.2.2 Regions Important for Proline Binding; 3.5.2.3 Functional Dynamics of PutP; 3.5.3 CitS; 3.6 Concluding Remarks and Perspective; References; 4 Prokaryotic Binding Protein-dependent ABC Transporters; 4.1 A Brief History of ABC Systems; 4.2 What is an ABC System?
4.3 The Composition of the Prokaryotic ABC Transporters
4.4 Associated Proteins and Signal Transduction Pathways; 4.5 The Components; 4.5.1 The Binding Proteins; 4.5.1.1 Substrate Recognition Sites are High-affinity Soluble Binding Proteins; 4.5.1.2 The Binding Test; 4.5.1.3 Special Examples; 4.5.1.4 Binding Proteins Undergo Conformational Changes upon Binding Substrate; 4.5.1.5 The Crystal Structure; 4.5.2 The Integral Transmembrane Domains (TMDs); 4.5.2.1 Organization; 4.5.2.2 Composition and Structure; 4.5.2.3 The Interaction of the TMDs with the Binding Protein; 4.5.2.4 The Sequence
4.5.3 The ABC Subunit

Sommario/riassunto

Transport of molecules across the cell membrane is a fundamental process of all living organisms. It is essential for understanding growth, development, nutrition as well as uptake and excretion of exogenous or synthesized molecules. Microbes represent general and basic functional systems where many transport processes have been studied on a molecular basis. Knowledge of the microbial transport processes will provide new perspectives to treatments by inhibitors, drugs, antibiotics, vitamins, growth promotion compounds, activators and toxic compounds of various kinds.
