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Po-Yuan Chen

The Application of Biofluid Mechanics

Boundary Effects on Phoretic Motions
of Colloidal Spheres

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and Technology
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Preface

In recent years, the pace of technological innovation is becoming more and more rapid, evolving from the exploration of phenomena from a traditional macroscopic point of view to the research of present microscopic scale biophysical phenomena. Among these researches, the research and development of nanomedicine and nanomaterials are drawing the attention of scientists and scholars, which makes it in a sense approximate to “Getting to know the world from one nut”.

The human body is an organism consisting of cells, the size scale of which ranges from several microns to several nanometers. Under such scale, the mobility behavior appears to be very significant, so it is also studied by many experts in biomedical fluid mechanics.

This book aims to discuss various mobility behaviors. The content is divided into two parts: one is the concentration gradient degree as the driving force of diffusion and penetration motions; and the other is temperature gradient-driven thermocapillary and thermophoretic motions. Among this, the diffusiophoresis and penetrate motion are mostly applied in the biomedical field such as drug delivery, purification, as well as the behavior description of immune system, etc.; the thermocapillary and thermophoresis are closely related to semiconductors production and removal of floating impurities. The Appendix contains the comparison and analysis of motion of colloidal particles in the gravitational field situation with the motion action. Eventually, there are relevant computer programs that are summarized into 150 pages. This part is written in FORTRAN language, for scholars to make further applications, and also for the general readers of non-engineering background to appreciate and use as references.

In short, I hope the publication of this book will be an entry for readers interested in motion action.

Po-Yuan Chen

Contents

1 Introduction	1
1.1 Preface	1
1.2 Diffusiophoresis	2
1.3 Osmophoretic Motion	5
1.4 Thermocapillary Motion	7
1.5 Thermal Motion	9
References	11
2 Diffusiophoresis of Spherical Colloidal Particles Parallel to the Plane Walls	15
2.1 Theoretical Analysis	15
2.1.1 Distribution Solute Concentration	16
2.1.2 Distribution of Fluid Velocity	19
2.1.3 The Deduction of Particle Diffusiophoresis Velocity	22
2.1.4 Calculation Methods of Figures	23
2.2 Results and Discussions	23
2.2.1 Diffusiophoresis of Particle Parallel to One Single Plate	23
2.2.2 Diffusiophoresis of Particle Parallel to Two Plane Walls	28
2.3 Conclusions	31
References	32
3 Osmophoretic Motion of the Spherical Vesicle Particle Parallel to Plane Walls	33
3.1 Theoretical Analysis	33
3.1.1 Distribution of Solute Concentration	34
3.1.2 Distribution of Fluid Velocity	36
3.1.3 The Derivation of Osmophoresis of Particles	38
3.2 Results and Discussion	38
3.2.1 Osmophoresis of Particle Parallel to Two Plane Walls	44
3.3 Conclusions	47
References	48

4	The Thermocapillary Motion of Spherical Droplet Parallel to the Plane Walls	49
4.1	Theoretical Analysis	49
4.1.1	Temperature Distribution	50
4.1.2	Distribution of Fluid Velocity.	52
4.1.3	Deduction of Droplet Thermocapillary Velocity	56
4.2	Results and Discussion.	56
4.2.1	The Thermocapillary Motion of Spherical Droplet Parallel to Single Plate	56
4.2.2	The Thermocapillary Motion of Spherical Droplet Parallel to the Plane Walls	62
4.3	Conclusion	65
	References	66
5	Thermophoresis Motion of Spherical Aerosol Particles Parallel to Plane Walls.	67
5.1	Theoretical Analysis	67
5.1.1	Distribution of Temperature	68
5.1.2	Distribution of Fluid Velocity.	70
5.1.3	Deduction of Particle Thermophoretic Velocity	72
5.2	Results and Discussions	73
5.2.1	Thermophoresis of Particle Parallel to One Single Plate	73
5.2.2	Thermophoresis of Particle Parallel to Two Plane Walls.	80
5.3	Conclusions	85
	References	85
6	General Discussions and Conclusions	87
6.1	General Discussions.	87
6.2	Conclusions	90