

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