

Contents

Introduction	1
1. Preliminaries	13
1.1. Basic Notation	13
1.2. Useful Results	15
2. Operator Classes, Maximal Regularity and Closedness of Operator Sums	23
2.1. Operator Classes	23
2.2. Maximal Regularity	30
2.3. Closedness of Operator Sums	31
I. Stokes- and Navier-Stokes Equations with Perfect Slip on Wedge Type Domains	35
3. Main Results	37
3.1. Notation in Part I	39
4. Transformation of the Linear Resolvent Problem	41
5. Holomorphic Functional Calculus and Maximal Regularity of the Laplacian	49
6. The Stokes Equations on a Wedge	63
7. The Navier-Stokes Equations	67
II. Global Solutions for a Class of Heterogeneous Catalysis Models	73
8. Main Results	75
8.1. Notation in Part II	77
8.1.1. Maximal Regularity Spaces	78
9. Outline of the Modeling	81

10. Linear Equations	85
10.1. $\mathcal{H}^\infty$ -Calculus for the Laplacian	87
10.2. Inhomogeneous Neumann Boundary Conditions	90
10.3. Perturbation	96
11. Local Well-Posedness	99
11.1. Nonnegativity of Concentrations	101
11.2. Existence of Solutions	104
12. Global Well-Posedness	109
12.1. Comparison Principle and Weak-type Estimates	110
12.2. Proof of Theorem 8.3	121
Summary	131
Zusammenfassung	135
Bibliography	139
Index	147
List of Symbols	149