Contents

1.	Preliminaries	•	1
	1. Introduction		1
	2. Rudimentary Derivation of the Cluster Theories.	•	4
	3. Notation and Some Mathematical Topics	•	17
	4. Potentials of Average Force · · · · · · ·	•	34
	5. Cluster Expansions	٠	41
2.	The Cluster Theory of Non-Ionic Systems	•	67
	6. Thermodynamics. Volume as an Independent Varia	1-	
	ble · · · · · · · · · · · · · ·	۰.	67
	7. The Theory of the Grand Partition Function \cdot \cdot	•	72
	8. The Density Expansion of the Excess Free Energy	•	88
	9. Spatial Correlation Functions	•	93
	10. Some Applications of the Cluster Theory \cdot \cdot \cdot	•	100
3.	Cluster Theory of Ionic Solutions	•	115
	11. Introduction $\cdot \cdot \cdot$	•	115
	12. Some Mathematical Aspects \cdot \cdot \cdot \cdot \cdot \cdot	•	125
	13. The Excess Free Energy of Ionic Systems	•	147
	14. Spatial Correlation Functions for Ionic Solutions ·	•	167
	15. Questions of Convergence \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot	•	173
4.	Application to Ionic Systems	•	191
	16. Thermodynamics. Pressure as an Independent Varia	Ł-	
	ble · · · · · · · · · · · · · ·	٠	191
	17. Solutions of a Single Electrolyte	•	208
	18. Mixed Electrolyte Solutions	٠	225
Appendix. Table of $J(L, K)$ · · · · · · · · · ·			249
Index of Notation		•	255
Subject Index			263