

CONTENTS

Preface	v
1. Introduction.....	1
PART I. ALGEBRA	3
2. Tensorial Sets	5
3. Irreducible Sets	11
4. Transition to Contragredience. Conjugation.....	17
5. Standard Sets	20
6. Invariant Products of Two Sets.....	27
7. Irreducible Products of Two Standard Sets. Wigner Coefficients	32
8. Irreducible Multiple Products of Standard Sets.....	40
9. Transformations Between Coupling Schemes.....	44
10. Invariant Triple Products. \bar{V} Coefficients	48
11. Recoupling of Triple Products. \bar{W} Coefficients	53
12. Recoupling of Quadruple Products. X Coefficients.....	59
PART II. QUANTUM MECHANICAL APPLICATIONS.....	63
13. Coupling and Recoupling of Atomic and Nuclear States.....	65
14. Tensorial Sets of Operators. The Wigner-Eckart Theorem...	76
15. Products of Tensorial Sets of Operators.....	83
16. Interaction Energy of Coupled Systems.....	87
17. Interaction of Coupled Systems with External Fields.....	95
18. Reduced Form of Operator Matrices.....	99
19. Angular Distribution of Radiations.....	106
APPENDICES	
A. Group Properties of r -transformations	121
B. Infinitesimal r -transformations and Angular Momentum	126
C. Properties of the Matrix U	133
D. Calculation of the Standard r -transformations	140
E. Differential Properties of r -transformations	144
F. Products of Identical Standard Sets of Degree $\frac{1}{2}$	151
G. Calculation of the Wigner Coefficients.....	153
H. Diagrams of Recoupling Relationships	156
I. Calculation of \bar{W} by Recursion Formulas. The Biedenharn Identity	159
J. Tensorial Formulation of the Dipole-Dipole Interaction ("Tensor Force")	163
K. References.....	166
Subject Index	169