

CONTENTS

	Page
Preface	iii
Contributors	ix
I. Particle Characterization and Measurement	
I.1 Particle Size	3
I.2 Size Measurement	15
I.3 Particle Density	35
I.4 Particle Shape Characterization	41
I.5 Adhesion Forces of Single Particle	51
I.6 Hardness of Particles	57
II. Physical and Chemical Properties of Powder	
II.1 Powder Mechanics	65
II.2 Description of Particulate Assemblies	73
II.3 Shearing Force of Powder Bed	89
II.4 Adhesion and Cohesion of Powder	99
II.5 Mechanical Strength	117
II.6 Fluidity of Powder	127
II.7 Permeation (Flow Through Porous Medium)	139
II.8 Adsorption Characteristics	151
II.9 Specific Surface Area	167
II.10 Moisture	183
II.11 Capillarity of Porous Media	193
II.12 Viscosity of Slurry	205
II.13 Electrical Properties	213
II.14 Magnetic Properties	221
II.15 Vibrational Characteristics	231
II.16 Acoustic Properties	239
III. Transport Phenomena and Related Topics	
III.1 Diffusion of Particles	257
III.2 Optical Phenomena	269
III.3 Electrophoresis	281
III.4 Agglomeration (Coagulation)	293
III.5 Particle Impact and Bouncing	307
III.6 Particle Sedimentation	313
III.7 Particle Sedimentation	327
III.8 Particle Motion in the Field	333
III.9 Combustion and Evaporation	339
III.10 Detonation and Dust Explosion	355
III.11 Segregation of Particles	359
III.12 Bridging	369
III.13 Sintering	379
III.14 solubility and Dissolution Rate	385
III.15 Mechanochemistry	395
IV. Preparation of Powder	
IV.1 Aerosol Particle Generation	407
IV.2 Dispersing Technology of Powder	417
IV.3 Electric Charge Control	425
IV.4 Powder Sampling	445
IV.5 Surface Modification	453
IV.6 Generation of Powder by Reaction	461

IV.7	Standard Test Dusts (Powders)	475
V.	Powder Handling Operations	
V.1	Crushing and Grinding	481
V.2	Classification	503
V.3	Dust Collection	525
V.4	Storage (Silo)	541
V.5	Feeding	551
V.6	Transportation	559
V.7	Drying	567
V.8	Granulation	575
V.9	Mixing	595
V.10	Crystallization	613
V.11	Gravity Thickening	621
V.12	Filtration	629
V.13	Expression	645
V.14	Kneading	653
V.15	Plastic Treatment	659
V.16	Heating of Ceramics	677
V.17	Reactors	681
V.18	Combustion Furnaces	699
V.19	Flotation	703
V.20	Magnetic Separation	715
V.21	Electrostatic Separation	725
VI.	Instrumentation	
VI.1	Dust Sampling	733
VI.2	Concentration and flow Rate Measurement	743
VI.3	Level Measurement of Powder	757
VI.4	Temperature Measurement of Powder	765
VI.5	Measurement of Powder Stress	771
Index		785