

Contents

Foreword	vii
Preface	ix
Introduction to Volume 8	xiii
Grouping of Materials and List of Figures and Tables	xvii

Theory, Estimation, and Measurement

<i>Notation</i>	1a
<i>Thermal Radiative Properties of Nonmetallic Solids</i>	3a
1. Introduction	3a
2. Definition of Terms	4a
A. Processes	4a
B. Things	5a
C. Quantities	5a
D. Properties	5a
E. Modifiers	5a
3. Thermal Radiative Properties	6a
A. Interrelationships of Properties	6a
B. Blackbody Radiation	7a
C. Kirchhoff's Law	8a
4. Physics of Thermal Radiation	8a
A. The Nature of Radiant Energy	8a
B. Basic Laws	9a
5. Interaction of Radiant Energy with Matter	12a
A. Wave Behavior	12a
B. Optical Properties	12a
C. Thermal Radiative Properties	12a
6. Detailed Discussion of Thermal Radiative Properties	13a
A. Primary Properties	13a
B. Subproperty Descriptors	14a
a. Geometric Descriptors	14a
b. Wavelength Descriptors	14a
c. Symbolic Representation	15a
C. Reflectance Factor	15a
7. Interrelationships between Properties	16a
A. Geometric Relations	16a
B. Wavelength Relations	17a
8. Theory of Nonmetallic Properties	19a
A. General Considerations	19a
B. Partially Transparent Material—Multiple Reflection Model	25a
C. Partially Transparent Material—Diffuse Model	27a
D. Scattering Phenomena	29a

9. Methods of Measurement	31a
A. Basic Techniques	31a
B. Reflectance Techniques	32a
a. Heated Cavity Reflectometers	32a
b. Integrating Sphere Reflectometers	34a
c. Integrating Mirror Reflectometers	36a
(i) Hemispherical Mirror Reflectometers	36a
(ii) Paraboloidal Mirror Reflectometers	37a
(iii) Ellipsoidal Mirror Reflectometers	38a
d. Specular Reflectometers	39a
e. Gonioreflectometers	39a
C. Radiometric Emittance Techniques	39a
a. General Considerations	40a
b. Rotating Cylindrical Sample Technique	40a
D. Calorimetric Techniques	41a
a. Measurements in the Range 270 to 500 K	41a
b. Measurements below 270 K	42a
<i>References to Text</i>	45a
Numerical Data	
<i>Data Presentation and Related General Information</i>	49a
1. Scope of Coverage	49a
2. Presentation of Data	49a
3. Classification of Materials	50a
4. Symbols and Abbreviations Used in Figures and Tables	51a
5. Convention for Bibliographic Citations	51a
6. Crystal Structures, Transition Temperatures, and Other Pertinent Physical Constants of the Elements	52a
7. Conversion Factors	52a
<i>Numerical Data on Thermal Radiative Properties of Nonmetallic Solids</i>	
(See pp xvii to xxxiv for detailed listing of entries for each of the following groups of materials)	1
1. Elements	1
2. Single Oxides	139
3. Mixtures of Single Oxides	551
4. Multiple Oxides and Salts	571
5. Nonoxide Compounds	677
6. Intermetallic Compounds	1271
7. Nonmetal–Metal Mixtures	1353
A. Sintered Pressed Powders	1353
B. Pressed Powders	1423
8. Miscellaneous Mixtures	1449
9. Glasses	1521
10. Minerals and Rocks	1651
11. Polymers	1703
<i>References to Data Sources</i>	1747
Material Index	
<i>Material Index to Thermal Radiative Properties Companion Volumes 7 and 8*</i>	A1

*The material index to Volume 9 (another thermal radiative properties companion volume) is not included here due to the sequence and schedule of its publication.