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Nota di contenuto	Mullite; Table of Contents; General introduction; List of Contributors; 1 Crystal Chemistry of Mullite and Related Phases; 1.1 The Mullite-type Family of Crystal Structures; 1.1.1 Introductory Remarks; 1.1.2 The Derivation of Mullite-type Crystal Structures; 1.1.3 Members of the Mullite-type Family of Crystal Structures; 1.1.3.1 Introduction; 1.1.3.2 MUL-II.1, P4(2)/mbc: Schafarzikite Group; 1.1.3.3 MUL-VI.11, P4(2)/mbc: Apuanite Group; 1.1.3.4 MUL-IV.12, Pbam: Bi(2)M(4)O(9) Group; 1.1.3.5 MUL-VIII.12, Pbam: Versiliaite Group; 1.1.3.6 MUL-VIII.2, Pbnm: Grandidierite Group 1.1.3.7 MUL-II.3, Pbam: Mullite Group 1.1.3.8 MUL-IV.31, Pnnm: Andalusite Group; 1.1.3.9 MUL-VIII.31, P2(1)/n11: Olivenite Group; 1.1.3.10 MUL-IV.32, Pbnm: Sillimanite Group; 1.1.3.11 MUL-VIII.33, A2(1)am: A(9)B(2) Boron Aluminates; 1.1.3.12 MUL-IV.34, P2(1)2(1)2: Al(5)Ge(0.972)Pb(0.2)O(9.71) Phase; 1.1.3.13 MUL-VIII.34, P2(1)2(1)2(1):

Mozartite Group; 1.1.3.14 MUL-XVI.351, A112/m: Boralsilite Group; 1.1.3.15 MUL-XXXII.352, P i: Werdington Group; 1.2 The Real Structure of Mullite; 1.2.1 Introduction; 1.2.2 High-resolution Electron Microscopy; 1.2.3 X-ray Investigation; 1.2.4 Real-structure Determination Using Videographic Reconstruction and Simulation Techniques; 1.2.4.1 The Videographic Method; 1.2.4.2 Structure Variants of Mullite; 1.2.4.3 Two-dimensional Videographic Reconstructions; 1.2.4.4 Three-dimensional Videographic Simulations for 2/1- and 3/2-mullite; 1.2.4.5 Conclusions; 1.3 Foreign Cation Incorporation in Mullite; 1.3.1 Transition Metal Incorporation; 1.3.1.1 Titanium Incorporation; 1.3.1.2 Vanadium Incorporation; 1.3.1.3 Chromium Incorporation; 1.3.1.4 Manganese Incorporation; 1.3.1.5 Iron Incorporation; 1.3.1.6 Cobalt Incorporation; 1.3.1.7 General Remarks on Transition Metal Incorporation; 1.3.2 Other Foreign Cation Incorporation; 1.4 Mullite-type Gels and Glasses; 1.4.1 Type I (Single Phase) Mullite Precursors and Glasses; 1.4.1.1 Preparation of Type I Mullite Precursors and Glasses; 1.4.1.2 Temperature-induced Structural Evolution of Type I Mullite Precursors and Glasses; 1.4.1.3 Mechanisms of Mullite formation From Type I Precursors and Glasses; 1.4.2 Type II (Diphasic) Mullite Precursors; 1.4.2.1 Synthesis of Type II Mullite Precursors; 1.4.2.2 Temperature-induced Structural Evolution of Type II Mullite Precursors; 1.4.3 Type III (Single Phase/Diphasic) Mullite Precursors; 1.4.3.1 Synthesis of Type III Mullite Precursors; 1.4.3.2 Temperature-induced Structural Evolution of Type III Mullite Precursors; 1.4.3.3 Mechanisms of Mullite Formation From Type III Mullite Precursors; 1.4.4 General Remarks on the Structure and Crystallization Behavior of Mullite Precursors and Glasses; 1.4.4.1 Mullite Precursors: Similarities and Differences; 1.4.4.2 The Coordination of Aluminum in Mullite Precursors and Glasses; 1.4.4.3 The Origins of Mullite Crystallization; References; 2 Basic Properties of Mullite; 2.1 Mechanical Properties of Mullite

Sommario/riassunto

The only book to provide a complete survey -- from the crystallographic fundamentals right up to recent high-tech applications in aerospace technology. Following a general introduction to the topic, the authors go on to cover the crystal chemistry of mullite and related phases, as well as its basic properties, phase equilibria and stability. One whole section is devoted to the synthesis and processing of mullite ceramics, while later ones cover mullite coatings, fibers and matrix composites. For materials scientists, solid state chemists and physicists, crystallographers and mineralogist
