

Contents

| | |
|--|----|
| Preface | ix |
| Introduction | xi |
| TRANSPARENT GLASSES AND CERAMICS | |
| Mesomechanical Constitutive Relations for Glass and Ceramic Armor D.R. Curran, D.A. Shockey, and J.W. Simons | 3 |
| Optimizing Transparent Armor Design Subject to Projectile Impact Conditions Xin Sun, Kevin C. Lai, Tara Gorsich, and Douglas W. Templeton | 15 |
| Physics of Glass Failure during Rod Penetration D.A. Shockey, D. Bergmannshoff, D.R. Curran, and J.W. Simons | 23 |
| Adhesive Bond Evaluation in Laminated Safety Glass using Guided Wave Attenuation Measurements S. Hou and H. Reis | 33 |
| Applying Modeling Tools to Predict Performance of Transparent Ceramic Laminate Armors C.G. Fountzoulas, J.M. Sands, G.A. Gilde, and P.J. Patel | 45 |
| An Economic Comparison of Hot Pressing vs. Pressureless Sintering for Transparent Spinel Armor A. LaRoche, K. Rozenburg, J. Voyles, L. Fehrenbacher, and Gary Gilde | 55 |
| Advances in Ballistic Performance of Commercially Available Saint-Gobain Sapphire Transparent Armor Composites Christopher D. Jones, Jeffrey B. Rioux, John W. Locher, Vincent Pluen, and Matthias Mandelartz | 63 |

| | |
|---|-----|
| Defect Free Spinel Ceramics of High Strength and High Transparency Juan L. Sepulveda, Raouf O. Loutfy, and Sekyung Chang | 75 |
| OPAQUE CERAMICS | |
| Recent Results on the Fundamental Performance of a Hot-Pressed Silicon Carbide Impacted by Sub-Scale Long-Rod Penetrators Jerry C. LaSalvia, Brian Leavy, Herbert T. Miller, Joshua R. Houskamp, and Ryan C. McCuiston | 89 |
| Instrumented Hertzian Indentation Study of Two Commercial Silicon Carbides H.T. Miller, R.C. McCuiston, and J.C. LaSalvia | 99 |
| Apparent Yield Strength of Hot-Pressed SiCs W.L. Daloz, A.A. Wereszczak, and O.M. Jadaan | 107 |
| Microstructural Examination and Quasi-Static Property Determination of Sintered Armor Grade SiC Memduh V. Demirbas, Richard A. Haber, and Raymond E. Brennan | 119 |
| Quantitative Characterization of Localized Amplitude Variations in Silicon Carbide Ceramics using Ultrasound C-Scan Imaging Raymond Brennan, James McCauley, Richard Haber, and Dale Niesz | 129 |
| Grain Boundary Engineering of Silicon Carbide by Means of Coprecipitation Steven Mercurio, Mihaela Jitianu, and Richard A. Haber | 141 |
| The Possible Roles of Stoichiometry, Microstructure, and Defects on the Mechanical Behavior of Boron Carbide Ryan McCuiston, Jerry LaSalvia, James McCauley, and William Mayo | 153 |
| A Review of Ceramics for Armor Applications P.G. Karandikar, G. Evans, S. Wong, M.K. Aghajanian, and M. Sennett | 163 |
| NOVEL EVALUATION AND CHARACTERIZATION | |
| A Portable Microwave Scanning Technique for Nondestructive Testing of Multilayered Dielectric Materials Karl Schmidt, Jack Little, and William A. Ellingson | 179 |
| Ballistic Damage Assessment of a Thin Compound Curved B ₄ C Ceramic Plate using XCT J.M. Wells and N.L. Rupert | 191 |

| | |
|---|-----|
| Evaluation of Ballistically-Induced Damage in Ceramic Targets by X-Ray Computed Tomography | 199 |
| William H. Green, Herbert T. Miller, Jerry C. LaSalvia, Datta P. Dandekar, and Daniel Casem | |
| Automated Nondestructive Evaluation System for Hard Armor Protective Inserts of Body Armor | 211 |
| Nicholas Haynes, Karl Masters, Chris Perritt, David Simmons, James Zheng, and James E. Youngberg | |
| Analysis of Hardness Indentation Size Effect (ISE) Curves in Ceramics: A New Approach to Determine Plasticity | 219 |
| Trevor E. Wilantewicz and James W. McCauley | |
| Author Index | 229 |