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Background; 3.3 Sensitivity Relationships; 3.4 Sensitivity: Some Relevant Factors; 3.4.1 Amino Substituents; 3.4.2 Layered (Graphite-Like) Crystal Lattice; 3.4.3 Free Space in the Crystal Lattice; 3.4.4 Weak Trigger Bonds; 3.4.5 Molecular Electrostatic Potentials; 3.5 Summary; Acknowledgments; References; 4. Advances Toward the Development of "Green" Pyrotechnics; 4.1 Introduction; 4.2 The Foundation of "Green" Pyrotechnics; 4.3 Development of Perchlorate-Free Pyrotechnics; 4.3.1 Perchlorate-Free Illuminating Pyrotechnics; 4.3.2 Perchlorate-Free Simulators; 4.4 Removal of Heavy Metals from Pyrotechnic Formulations; 4.4.1 Barium-Free Green-Light Emitting Illuminants; 4.4.2 Barium-Free Incendiary Compositions; 4.4.3 Lead-Free Pyrotechnic Compositions; 4.4.4 Chromium-Free Pyrotechnic Compositions; 4.5 Removal of Chlorinated Organic Compounds from Pyrotechnic Formulations; 4.5.1 Chlorine-Free Illuminating Compositions; 4.6 Environmentally Friendly Smoke Compositions; 4.6.1 Environmentally Friendly Colored Smoke Compositions; 4.6.2 Environmentally Friendly White Smoke Compositions; 4.7 Conclusions; Acknowledgments; Abbreviations; References; 5. Green Primary Explosives; 5.1 Introduction; 5.1.1 What is a Primary Explosive?; 5.1.1.1 Common Initiating Devices: Detonators/Primers/Blasting Caps; 5.1.2 The Case for Green Primary Explosives; 5.1.3 Legacy Primary Explosives; 5.1.3.1 Lead Azide (LA); 5.1.3.2 Lead Styphnate (LS); 5.2 Green Primary Explosive Candidates; 5.2.1 Inorganic Compounds; 5.2.1.1 Silver Azide (SA); 5.2.1.2 Other Inorganic Azides; 5.2.1.3 Nickel Hydrazine Nitrate (NHN)

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## Sommario/riassunto

Since the end of the 20th century it has been increasingly realised that the use, or production, of many energetic materials leads to the release of substances which are harmful to both humans and the environment. To address this, the principles of green chemistry can be applied to the design of new products and their manufacturing processes, to create green energetic materials that are virtually free of environmental hazards and toxicity issues during manufacturing, storage, use and disposal. Active research is underway to develop new ingredients and formulations, green synthetic methods a

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