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Nota di contenuto	Guidelines for Safe Storage and Handling of Reactive Materials; Contents; Preface; Acknowledgments; Acronyms; Introduction; 1. Chemical Reactivity Hazards; 1.1. Framework for Understanding Reactivity Hazards; 1.1.1. Grouping of Reactivity Hazards into General Categories; 1.1.2. Key Parameters That Drive Reactions; 1.1.3. Types of Runaway Reactions; 1.1.4. How Reactive Chemical Storage and Handling Accidents are Initiated; 1.2. Self-Reactive Polymerizing Chemicals; 1.2.1. Thermal Instability; 1.2.2. Induction Time; 1.2.3. Example; 1.3. Self-Reactive Decomposing Chemicals; 1.3.1. Peroxides 1.3.2. Self-Accelerating Decomposition Temperature1.3.3. Predicting Instability Potential; 1.3.4. Deflagration and Detonation of Pure Material; 1.3.5. Slow Gas-Forming Reactions; 1.3.6. Heat of Compression; 1.3.7. Minimum Pressures for Vapor Decomposition; 1.3.8. Shock Sensitivity; 1.3.9. Examples of Shock Sensitivity; 1.4. Self- Reactive Rearranging Chemicals; 1.4.1. Isomerization; 1.4.2. Disproportionation; 1.5. Reactivity with Oxygen; 1.5.1. Spontaneous Ignition and Pyrophoricity; 1.5.2. Pyrophoricity versus Hypergolic Properties; 1.5.3. Accumulation and Explosion of Pyrophoric Materials

1.5.4. Competition between Air and Atmospheric Moisture 1.5.5. Peroxide Formation; 1.6. Reactivity with Water; 1.6.1. Water Reactivity: Fast and Slow Reactions; 1.6.2. Water-Reactive Structures; 1.7. Reactivity with Other Common Substances; 1.7.1. Reactions with Metals; 1.7.2. Surface Area Effects; 1.7.3. Catalyst Deactivation and Surface Passivation; 1.8. Reactive with Other Chemicals: Incompatibility; 1.8.1. Oxidizing and Reducing Properties; 1.8.2. Acidic and Basic Properties; 1.8.3. Formation of Unstable Materials; 1.8.4. Thermite-Type Reactions 1.8.5. Incompatibility with Heat Transfer Fluids and Refrigerants 1.8.6. Adsorbents; References; 2. Chemical Reactivity Classifications; 2.1. NFPA Reactivity Hazard Signal; 2.1.1. NFPA 704 Rating System for Overall Reactivity; 2.1.2. Definitions for Reactivity Signal Ratings; 2.1.3. Reactivity Hazards Not Identified by NFPA 704; 2.1.4. NFPA Reactivity Ratings for Specific Chemicals; 2.2. NPCA Hazardous Materials Identification System; 2.3. Classifications of Organic Peroxides; 2.3.1. SPI 19A Classification of Organic Peroxides; 2.3.2. NFPA 43B Classification of Organic Peroxides 2.4. Classification of Materials That Form Peroxides 2.5. Classification of Water-Reactive Materials; 2.5.1. Materials That React Violently with Water; 2.5.2. Materials That React Slowly with Water; References; 3. Materials Assessment; 3.1. Prior Experience Review; 3.1.1. Common Knowledge; 3.1.2. Analogy; 3.1.3. Safety Data and Literature; 3.2. Theoretical Evaluations; 3.2.1. Unstable Atomic Groups; 3.2.2. Oxygen Balance; 3.2.3 Thermodynamics: Heat of Formation; 3.2.4. Thermodynamics: Heats of Reaction and Self-Reaction; 3.2.5. Thermodynamics: Equilibrium Considerations; 3.2.6. CHETAH 3.2.7. Example Evaluation

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## Sommario/riassunto

With new and growing interest in dealing with the hazards of reactive chemicals, this book offers guidelines that can significantly reduce the risk or mitigate the severity of accidents associated with storing and handling reactive materials. Necessary elements of a reliable system to prevent equipment or human failures that might lead to a reactive chemical incident are sound and responsible management policies, together with a combination of superior siting, design, fabrication, erection, inspection, monitoring, maintenance, operations and maintenance of facilities. These Guidelines deal wit

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