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Reactors; 4.2.5 Reactive Distillation; 4.2.6 Storage of Hazardous Materials; 4.2.7 Process Piping
4.2.8 Process Equipment4.3 Substitute; 4.3.1. Reaction Chemistry; 4.3.2 Solvents; 4.3.3 Refrigerants and Firefighting Agents; 4.4 Moderate; 4.4.1 Dilution; 4.4.2 Refrigeration; 4.4.3 Less Severe Process Conditions; 4.4.4 Secondary Containment-Dikes and Containment Buildings; 4.5 Simplify; 4.5.1 Inherently Robust Process Equipment; 4.5.2 Vacuum; 4.5.3 Runaway Reactions; 4.5.4 Containment Vessels; 4.5.5 Heat Transfer; 4.5.6 Liquid Transfer; 4.5.7 Reactor Geometry; 4.5.8 Distributed Control Systems; 4.5.9 Separation of Process Steps; 4.5.10 Limitation of Available Energy; 4.6 Other Strategies
4.6.1 Limitation of Effects4.6.2 Global Hazards; 4.6.3 Avoid Incorrect Assembly; 4.6.4 Making Status Clear; 4.7 Summary; 5. Life Cycle Stages; 5.1 General Principles Across All Life Cycle Stages; 5.2 Research; 5.2.1 Inherently Safer Synthesis; 5.2.2 Types of Hazards Associated With Research; 5.2.3 Research Stage-Hazards Identification Methods; 5.3 Process Development; 5.3.1 Unit Operations - General; 5.3.2 Unit Operations - Specific; 5.4 Detailed Design and Construction; 5.4.1 Process Design Basis; 5.4.2 Equipment; 5.4.3 Process Controls; 5.4.4 Supporting Facilities; 5.4.5 Batch Processes
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6.4.2 Design of Equipment and Controls

Sommario/riassunto

Inherently Safer Chemical Processes presents a holistic approach to making the development, manufacture, and use of chemicals safer. It discusses strategies for substituting more benign chemicals at the development stage, minimizing risk in the transportation of chemicals, using safer processing methods at the manufacturing stage, and decommissioning a manufacturing plant. Since the publication of the original concept book in 1996, there have been many developments on the concept of inherent safety. This new edition provides the latest knowledge so that engineers can derive maximum bene