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Nota di contenuto	Cover; Title Page; Copyright Page; Contents; Preface; 1. Global Polyethylene Business Overview; 1.1 Introduction; 1.2 The Business of Polyethylene; 1.3 Cyclical Nature of the Polyethylene Business; 1.3.1 Global Feedstock Cost Variations; 1.3.2 Change in Middle East Feedstock Cost Advantage; 1.3.2.1. 2012 Capital Requirements for an Integrated Ethylene/Polyethylene Facility; 1.4 Early History of Ethylene and Polyethylene Manufacturing; 1.4.1 Discovery of Polyethylene; 1.4.1.1 Branched High-Pressure Polyethylene; 1.4.1.2 Linear Polyethylene 1.4.2 Linear Low-Pressure Polyethylene - High-Density Polyethylene1. 4.3 Manufacture of HDPE (1955-1975); 1.4.3.1 Phillips Catalyst Produced HDPE with Higher Product Demand; 1.4.3.2 Phillips Catalyst Manufacturing Advantages; 1.4.3.3 Second Generation Ziegler Catalysts; 1.4.4 Single-Site Ethylene Polymerization Catalysts; 1.4.5 Status of the Polyethylene Industry as of 2010; 1.4.6 Global Demand for Polyethylene in 2010; 1.4.7 Polyethylene Product Lifecycle; 1.4.7.1

North American Polyethylene Market; 1.4.8 Comparison of Other Global Polyethylene Markets with the North American Market
1.4.9 Growth of the Global Consumer Class1.4.9.1 Quantitative Forecast for the Growth of the Global Middle Class; 1.4.10 Global Economic Freedom; 1.4.11 Future Economic Growth in India and China; 1.4.12 Long-Term Global Polyethylene Capacity Expansion (2010-2050); 1.4.12.1 Location of New Ethylene/Polyethylene Capacity (2010-2050); 1.4.13 Ethylene Feedstock Costs; 1.4.13.1 Manufacture of Ethylene; 1.4.13.2 Crude Oil and Natural Gas Prices; 1.4.14 Impact of the Shale Natural Gas Revolution on Global Polyethylene Business; 1.4.15 Natural Gas Liquids; 1.4.15.1 North American Natural Gas Supply
1.4.15.2 Globalization of Natural Gas1.4.15.3 Status of Ethylene Costs as of 2010 and Future Trends; 1.4.15.4 Additional Feedstock for Ethylene Production; 1.4.15.5 U.S. Ethylene Forecast by Burns & McDonnell (2013); 1.4.15.6 Ethylene Based on New Feedstock; 1.4.15.7 Methane/Methanol as Feedstock for Ethylene; 1.4.15.8 Biomass as Feedstock; 1.4.15.9 Governmental Policy and Regulation; 1.4.16 Environmental Factors; 1.4.16.1 Polyethylene Recycling - Waste-to-Energy; 1.4.16.2 Biodegradation; 1.4.17 Biobased Ethylene; References
2. Titanium-Based Ziegler Catalysts for the Production of Polyethylene2.1 Introduction; 2.2 Titanium-Based Catalyst Developments; 2.2.1 Historical Developments; 2.2.2 The Role of Professor G. Natta; 2.2.3 Historical Controversy - Isotactic Polypropylene with Cr-Based Catalyst; 2.3 Titanium-Based Catalysts for the Manufacture of Polyethylene; 2.3.1 First Generation Ziegler Catalysts for the Manufacture of Polyethylene; 2.3.2 Types of Metal Alkyls Investigated; 2.3.3 Soluble Titanium-Based Complexes for Ethylene Polymerization (1955-1960); 2.3.4 Mechanism of Polymerization
2.4 Second Generation Ziegler Catalyst for the Manufacture of Polyethylene

Sommario/riassunto

The history of the business and technology that was responsible for the enormous growth of the global polyethylene industry from the laboratory discovery in 1933 to reach an annual production of over 75 million metric tons in 2012 and become the leading plastic material worldwide. This book is an in-depth look at the history of the scientists and engineers that created the catalysts and the methods used for the modern commercial manufacture of polyethylene and its products. The book outlines the processes used for the manufacture of polyethylene are reviewed which include the high-pressure p

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