Petroleum & Petroleum Products Technology Handbook (Thermal Cracking of Pure Saturated Hydrocarbons, Petroleum Asphalts, Refinery Products, Blending and Compounding, Oil Refining and Residual Fuel Oils)

Author: NPCS Board of Consultants & Engineers

Format: Paperback **ISBN**: 9788193733912

Code: NI528 Pages: 440

Price: Rs. 1,875.00 US\$ 50.67

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within 5 days

Petroleum asphalt is a sticky, black and highly viscous liquid or semi-solid that is present in most petroleum crude oils and in some natural deposits. Petroleum crude oil is a complex mixture of a great many different hydrocarbons. Refined petroleum products are derived from crude oils through processes such as catalytic cracking and fractional distillation. Refining is a necessary step before oil can be burned as fuel or used to create end products.

Residual fuel oil is a complex mixture of hydrocarbons prepared by blending a residuum component with a flux stock which is a distillate component diluent, to give the desired viscosity of the fuel oil produced. Petroleum refining is the process of separating the many compounds present in crude petroleum. An Oil refinery or petroleum refinery is an industrial process plant wherecrude oil is processed and refined into more useful products

The global Petroleum Asphalt market is valued at USD 48.8 Billion in 2017 and is expected to reach USD 77.67 Billion by the end of 2024, growing at a Growth Rate of 6.87% between 2017 and 2024. The global bunker fuel market was valued at \$137,215.5 million in 2017 and is expected to reach \$273,050.4 million by 2025, registering a CAGR of 9.4% from 2018 to 2025.

Some of the fundamentals of the book are composition of radiation effects on lubricants, thermal cracking of pure saturatedhydrocarbons, petroleum asphalts, refinery products, refinery feedstocks, blending and compounding, oil refining, residual fuel oils, distillate heating oils, formulations of petroleum, photographs of machinery withsuppliers contact details.

A total guide to manufacturing and entrepreneurial success in one of today's most lucrative petroleum industry. This book is one-stop guide to one of the fastest growing sectors of the petroleum industry, where opportunities abound for manufacturers, retailers, and entrepreneurs. This is the only complete handbook on the commercial production of petroleum products. It serves up a feast of how-to information, from concept to purchasing equipment.

Contents

1. RADIATION EFFECTS ON LUBRICANTS

Introduction

Interaction of Radiation with Organic Matter

General Physical Effects of Radiolysis

Base Oils

The Radiation Environment

Hydrocarbons (Petroleum Oils)

Alkylaromatics

Ethers

Esters

Silicones

Halogenated Compounds

Additives

Radiation Damage Inhibitors

Antioxidants

Viscosity Index Improvers

Antiwear Additives

Extreme Pressure (EP) Agents

Foam Inhibitors

Rust Inhibitors

Environmental Factors

Effects of Radiation Type and Intensity

Role of Temperature

Influence of Oxygen

Oil Lubricants

General: Commerical formulations

Based on Alkylaromatic Fluids

Fluids Based on Poly (phenyl ethers)

Steam Turbine Oils

Aircraft Turbine Oils

Hydraulic Fluids

Lubricating Greases

Gelling Agents

CONTENTS

Base Oils

Commerical Greases

Greases of Enhanced Radiation Resistance

Dynamic Tests

Principles

2. THERMAL CRACKING OF PURE SATURATED

HYDROCARBONS 65-102

Introduction

Experimental Methods

Batch Reactors

Flow Reactors

Residence Time

Volume Change on Reaction

Kinetics of the Cracking Process

Rates of Decomposition

Straight Chain Paraffins

Correlation of the Rate Constants for n-Paraffins

Effect of Branching on the Rate of Decomposition

Effect of Pressure on the Decomposition of Paraffinic

Hydrocarbons

Rates of Decomposition-Saturated Cyclic Hydrocarbons

Estimation of Rate Constant of Decomposition

APPENDIX

Calculation of Product Distribution from Paraffin Cracking by the Rice-Kossiakoff Method.

3. PETROLEUM ASPHALTS

Chemical and Physical Composition
Possible Structures of the Nuclei in Resins and Asphaltenes
Manufacture of Asphalt from Petroleum
uses of Asphalts

4. REFINERY PRODUCTS

Low-boiling Products

Gasoline

Gasoline Specifications

Distillate Fuels

Jet and Turbine Fuels

Automotive Diesel Fuels

Railroad Diesel Fuels

Heating Oils

Residual Fuel Oils

5. REFINERY FEEDSTOCKS

Crude Oil Properties

- 1. API Gravity
- 2. Sulfur Content, Wt%
- 3. Pour Point, °F (°C)
- 4. Carbon Residue, Wt%
- 5. Salt Content, 1lb/1000 bbl
- 6. Characterization Factors
- 7. Nitrogen Content, Wt%
- 8. Distilation Range
- 9. Metals Content, ppm
- 10. Total Acid Number

Composition of Petroleum

- 1. Paraffins
- 2. Olefins
- 3. Naphthenes (Cycloparaffins)
- 4. Aromatics

Crudes Suitable for Asphalt Manufacture

Crude Distillation Curves

Problems

6. BLENDING AND COMPOUNDING

7. OIL REFINING

Introduction

General Aspects of Oil Refining

Crude Oils and Products

Crude Oil Constituents

Classification of Crude Oils

Oil Products

1. Gas Fuels

2. Liquid Fuels

Nonfuel Applications

Oil Refining Processes

Crude Oil Distillation

Atmospheric Distillation

Vacuum Distillation

Crude Oil Desalting

Catalytic Cracking (Cat Cracking)

Hydrotreating

Distillate Hydrotreating

Pyrolysis Gasoline Hydrotreating

Desulfurizing by Adsorption

Catalytic Reforming

Introduction

Semiregenerative Reformer

Fully Regenerative Reformer

Continuously Regenerative Reformer

Hydrocracking

Residue Conversation Process Introduction

Fundamentals of Residue Conversion and Process Options

Hydrogen Addition ("H-in") Processes

Residue Hydrotreating (Demetallization, Desulfurization,

Denitrification)

Residue Hydrocracking (Hydroconversion)

Carbon Rejection ("C-out") Processes

Thermal Processes (Visbreaking, Coking)

Catalytic Processes (Residue Cat Cracking)

Other Processes

Extraction of Asphaltenes

Partial Oxidation

Process Combinations

Gasoline Upgrading Processes

- 1. Alkylation
- 2. Polymerization
- 3. Isomerization
- 4. Production of Ethers (MTBE, ETBE)

Other Processes

Gas Treating

Sulfur Recovery

Catalysts

Environmental Protection in Oil Refining

Introduction

Manufacturing Emissions

Hydrocarbons

Hydrocarbons in Air

Hydrocarbons in Wastewater

Hydrocarbons in Soil and Groundwater

Sulfur and Nitrogen Compounds

Sulfur Compounds

Nitrogen Compounds

Consumer Related Emissions

Transportation Fuels

Motor Gasoline

Diesel Fuel

Marine Fules

Fuels for Heat Generation

Cost of Environmental Conservation

Integrated Refinery Models

Trends of Refinery Structures

Hydroskimming Refinery

Conversion Concepts

Cat Cracking – Visbreaking Refinery

Hydrocraking- Cat Cracking Refinery

Hydrocracking - Coking Refinery

Integration of Existing Refineries

Corrosion and Materials

Testing and Analysis

Crude Oil and Product Properties

Testing Methods and Standards

Storage and Transport

8. RESIDUAL FUEL OILS

History

Specifications For Residual Fuels

Fluidity

Thermal Stability

Explosiveness

Pacific Specifications for Fuel Oils

Detailed Inspections of Heavy Fuels

End uses of Residual Fuel Oils

Steam Boilers

Industrial Applications

Diesel Engines

Gas Turbines

Gas-enrichment Oils

Problems Associated with Utilization

Sulfur in Residual Fuel Oils

Ash Possible Source of Contaminants

Soot and Carbon Particles

Instability and Incompatibility

The Combustion of Residual Fuels

Heating Value

Chemistry of Combustion

Flue-gas Analysis

Humidity in Air and Flue Gases

Heat Content of Flue Gases

Specific Heat of Fuel Oils

Residual Fuel Oil Burners

9. DISTILLATE HEATING OILS

Status of the Heating-Oil Industry

Burners, Controls and Tanks

Central-Heating Systems

Burning Qualities in Oils

Stability in Heating Oils
Handling and Delivery
10. FORMULATIONS OF PETROLEUM

11. PHOTOGRAPHS OF MACHINERY WITH SUPPLIERS CONTACT DETAILS

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes varies process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES , 106-E, Kamla Nagar, New Delhi-110007, India. Email: npcs.india@gmail.com Website: NIIR.org

Wed, 20 Mar 2024 15:39:21 +0530