

Modern Technology of Petroleum, Greases, Lubricants & Petro Chemicals (Lubricating Oils, Cutting Oil, Additives, Refining, Bitumen, Waxes with Process and Formulations) 3rd Revised Edition

Author: NIIR Board of Consultants & Engineers

Format: paperback

Code: NI45

Pages: 624

Price: Rs 1995 | US\$ 150

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Shipping: 5 days

About the Book

Lubricants, greases and petrochemicals are most versatile on the Industrial Plateau now a day. The significance of Lubricants, Greases and specialty products in the day to day functioning of nearly every machine part, instrument, appliance & device cannot be over emphasized lubricants reduce friction & wear between rubbing parts, thereby enhancing their life. A lubricant is a substance introduced to reduce friction between moving surfaces. It may also have the function of transporting foreign particles. The property of reducing friction is known as lubricity. The broad types of lubricating oils are as under; crankcase oils, gear oils, metal working oils, metal drawing oils, spindle and other textile oils, steam turbine oils. Synthetic lubricants have a higher viscosity index, but are less stable to oxidation. They are suitable for high temperature applications. In the modern industrial year, greases have been increasingly employed to cope with a variety of difficult lubrication problems, particularly those where the liquid lubricant is not feasible. Greases are essentially solid or semi solid lubricants consisting of gelling or thickening agent in a liquid lubricant. Greases and lubricants are one of the important products derived from crude petroleum. Petroleum is formed by hydrocarbons (a hydrocarbon is a compound made up of carbon and hydrogen) with the addition of certain other substances, primarily sulphur. Petroleum in its natural form when first collected is usually named crude oil, and can be clear, green or black and may be either thin like gasoline or thick like tar. The principal product of petroleum refining are motor gasoline, aviation gasoline, kerosene, jet fuels, diesel fuels, lubricating oils and fuel oils. Considerable quantities of petroleum wax, bitumen, liquid petroleum gases (LPG), industrial naphtha and coke are also produced. Petrochemicals are chemicals made from petroleum (crude oil) and natural gas. Petroleum and natural gas are made up of hydrocarbon molecules, which are comprised of one or more carbon atoms, to which hydrogen atoms are attached. The Indian lubricants industry claims to be the sixth largest in the world. The petrochemical industry in India has been one of the fastest growing industries in the country. This industry also has immense importance in the growth of economy of the country and the growth and development of manufacturing industry as well.

Some of the fundamentals of the book are types of lubricating oils, crankcase oils, gear oils, metal working oils, metal drawing oils, spindle and other textile oils, steam turbine oils, synthetic lubricants, formulations and compounding of lubricants, additives for straight mineral oil gear lubricants, raw materials for lubricants, equipments for lubricants manufacture, reclamation of used lubricating oil, nature of contaminants in used lubricating oil, gravity methods of purification, metal forming and deforming lubricant, cutting oils, heat treatment oils, greases, sodium soap greases, lithium soap greases, aluminium soap greases, mixed soap greases, complex soap greases etc.

The objective of this book is to furnish comprehensive information about nearly all prominent types of lubricants, greases and petrochemicals. This book covers formulae, processes of various petroleum items. This book is an invaluable resource for entrepreneurs, existing units, professionals, institutions etc.

Contents

1. TYPES OF LUBRICATING OILS

- Crankcase Oils
 - Gear Oils
 - Metal Working Oils
 - Metal Drawing Oils
 - Spindle and Other Textile Oils
 - Steam Turbine Oils
 - Synthetic Lubricants
 - Miscellaneous Oils
 - Fatty Oils
 - Residual and Petrolatums as Lubricants
 - Asphalt Residual as Lubricants
 - Application of Asphalt Residual as Lubricants
 - Petrolatums as Lubricants
 - Paraffin Wax as Lubricant
 - Resinous Materials as Lubricants
 - Solid Lubricants
 - Thickeners
 - Carbohydrates and Proteins as Thickeners
 - Polymers as Thickening Agents
 - Acetylene Black as a Thickener
 - Petroleum Lubricants
 - Bolt Lubricants
 - Cryogenic Bearing Lubricants
 - Lubricants for Missile Systems
 - Lubrication with Glass
- ### 2. FORMULATIONS AND COM-POUNDING OF LUBRICANTS
- Additives for straight Mineral Oil gear Lubricants
 - Formulation of Open or Exposed Lubricants
 - Formulation of mild type E.P. Lubricants
 - Aircraft Lubricant
 - Miscellaneous Formulation
- ### 3. RAW MATERIALS FOR LUBRICANTS
- Test for good fatty acid
 - Prefomed Soaps
 - Advantages and the Use of Prefomed Soaps
 - Lubricating Oil
 - Gravity of Lubricating Oil
 - Pour Point of Oil
 - Dyes for Colour
 - Perfume
 - Filler
 - Synthetic Lubricants
- ### 4. EQUIPMENTS FOR LUBRICANTS MANUFACTURE
- Equipments
 - Handling Packaged Raw Material
 - Equipment for Saponification

Equipment for Dispersion of Thickening Agents
Manufacture of Lubricating Oils
Milling Equipment
5. RECLAMATION OF USED LUBRICATING OIL
Nature of Contaminants in Used Lubricating Oil
Gravity Methods of Purification
Filtration
Regenerating Process of Used Lube Oil
Contaminants present in Used Lube Oil
Principles of Used Lube Oil
Existing Process for Regeneration of Used Lubricating Oils
Lubricant Recycling
Reprocessing
Reclamation
6. ADDITIVES FOR LUBRICANTS
Antioxidants, Rust & Corrosion Inhibitors
Extreme Pressure Additives Antiwear Agents
Foam Inhibitors
Viscosity Index Improvers
Detergents and Dispersants
Pour Point Depressants
Antiknock Agents
Antiscrackers Agents
7. CHARACTERISTICS OF LUBRICATING OILS
Viscosity Index of Lubricating Oils
Vapour Pressure
Gravity of Lab Oil
Thermal Properties
Electrical Properties
Properties under High Pressure
Surface Properties
Carbon Residue
Colour of Tube Oils
Neutralisation No
Saponification No of Petroleum Products
Aniline Point of Petroleum Products
Ash content of Petroleum Oils
Precipitation No of Lube Oils
8. CUTTING OILS
Metal Forming and Deforming Lubricant
Cutting Oils
Heat Treatment Oils
Industrial Applications
Types of Cutting Oils
E.P. Additives or Anti Weld
Future Trend of Cutting Oil
Formulations of cutting oils
Hydrogenation Process in Lube Oil Production
Choice of Catalyst
9. GREASES
Solid Lubricants

Semi Solid Lubricants
Solid Lubricants
Greaves Lubricants
Type of Greases
Calcium Soap
Sodium Soap Greases
Lithium Soap Greases
Aluminium Soap Greases
Mixed Soap Greases
Complex Soap Greases
Non-Soap Greases
Properties of Greases
Grease Applications
Market Position
Fillers
Carbon Black
Asbestos
Mica
Vermiculite
Talc
Various clay or silicate
Metal Powder
Metal Oxide
Manufacturing Process for Grease
Industrial Grease
Manufacturing Process of Greases in General
Fire Hazards in the Manufacture
Processing of aluminium base lubricants and greases
Production of another Barium Base Lubricating Grease
Preparation of Lead Soaps
Preparation of Lead Base Lube Greases
10. FORMULATION OF GREASES
Mixed Base Lubricating Greases
Colouring Lubricating Oils
Refining of Lube Oil
Purification of Lube Oil
Reclaiming Used Lube Oil
Non-Bleeding Grease
11. LUBRICANTS AND THEIR MANUFACTURE
Composition of Mineral Oil
Refining
Blending
Synthetic Hydrocarbon
Synthetic Non hydrocarbons
Polyalkylene Glycols
12. VARIOUS FORMULATIONS OF LUBRICANTS AND GREASES
Textile Lubricant for Spinning Jute, etc.
Application of Lead Base Lubricating Greases
Preparation of Lube Grease from Normal Strontium Soap
Mixture Base Strontium Soap Lubricating Greases

Complex Soap Lubricating Greases

Importance of Soap Salt complexes and their characteristics

13. ANALYSIS OF QUALITY ASSESSMENT OF LUBRICATING GREASES AND PETROLEUM PRODUCTS

Lubricating Greases

Analysis

Tests for Melting or Liquefaction

14. REFINING OF PETROLEUM PRODUCTS

Chemical Refining

Physical Refining

Solvent Extraction Processes

Dewaxing

Propane Dewaxing

Benzol-Acetone Dewaxing

Benzol Sulphur Dioxide Dewaxing

15. MANUFACTURE OF ASPHALTIC BITUMEN

Steam-Refined Asphaltic Bitumen

Blown Asphaltic Bitumen

Pitch-Type Asphaltic Bitumen

16. CHEMICALS FROM PETROLEUM

Feedstocks

Chemicals from saturated hydrocarbons

Chemicals from Olefins

Oxidation of Olefins

Chlorination of Ethylene

Chlorination of Olefins

Chlorination of Propylene

Chlorination of Butenes

Chlorhydration of Olefins

Hydrochlorination of Olefins

Sulphonation of Olefins

Oxo Process

Ketones and their derivatives

Aldehydes and their derivatives

Acids and their derivatives

Acetic Acid and Acetic Anhydride

Olefin oxides and their derivatives

Aromatics

Naphthenes and Naphthenic Acids

Carbon Monoxide-hydrogen system

Inorganic Compounds

17. NATURAL AND CRACKED GASES

General Properties

Natural Gas

Refinery gas

Liquefied petroleum gas

18. PETROLEUM WAXES

Nature of the petroleum waxes

Composition of the petroleum waxes

Production of waxes

The properties of petroleum waxes

Paraffin Waxes

Microcrystalline waxes

Solid state transitions in paraffin waxes

The effect of crystallinely modifying agents of the properties of paraffin wax

Utilization of petroleum waxes

19. BITUMEN

Emulsions and cutbacks

Rheological Properties

Wetting and adhesive properties

Application

Industrial applications

20. PETROLEUM PRODUCTS

L.P.G. (Liquefied Petroleum Gas)

Synthesis Gas

Motor Gasoline

Aviation Gasoline

Kerosene

Jet Fuels

Diesel Fuels

Industrial Naphthas

Heating Oils and Residual Fuel Oils

Light, Medium and Heavy Fuel Oils

Petroleum Waxes

Micro Crystalline Wax from slack wax

Petroleum Jelly

Bitumen

Petroleum Coke

Carbon Black

21. ABS RESIN

Uses and Applications

Manufacturing Process

22. ACETALDEHYDE

23. ACETIC ACID

24. ACETONE

25. ACRYLAMIDE MONOMER

26. ACRYLONITRILE

27. BENZALDEHYDE

28. ADIPIC ACID

29. BENZENE HEXACHLORIDE (B.H.C.)

30. BENZOIC ACID

31. BENZYL CHLORIDE

32. BISPHENOL -A

33. BUTADIENE

34. DIETHYL TOLUAMIDE

35. DIMETHYL FORMAMIDE

36. ETHYL ACETATE

37. ETHYLENE OXIDE

38. FORMALDEHYDE

39. FORMIC ACID

40. FUMARIC ACID



41. ISO PROPYL ALCOHOL
42. METHYL AMINES
43. NITROBENZENE
44. PHTHALIC ANHYDRIDE
45. POLY CARBONATES
46. POLYOLS
47. POLYURETHANE FOAM
48. VINYL CHLORIDE
49. STRUCTURE OF PETROLEUM
 - Molecular Species in Petroleum
 - Volatile Fractions
 - Nonvolatile Constituents
 - Resin Constituents
 - Composition
 - Structure
 - Molecular Weight
50. SCOPE AND LIMITS OF LUBRICANT TESTING
 - Fresh oil testing of industrial oils
 - Fresh oil testing of engine oils
51. LUBRICANT STORAGE
 - Lubricant life
52. COLLOIDAL STABILITY OF LUBRICANTS
 - Low-Temperature Stability
 - Hot-Temperature Stability
53. REFINERY WASTES
 - Process Wastes
 - Desalting
 - Distillation
 - Thermal Cracking
 - Coking Processes
 - Fluid Catalytic Cracking
 - Hydro cracking and Hydro treating
 - Catalytic Reforming
 - Alkylolation
 - Isomerization
 - Polymerization
 - Deasphalting
 - Dewaxing
 - Gas Processing
54. TYPES OF WASTE
 - Gases and Lower Boiling Constituents
 - Higher Boiling Constituents
 - Waste Water
 - Spent Caustic
 - Solid Waste
55. WASTE TOXICITY
56. MANAGEMENT OF REFINERY WASTE
57. PLANT & MACHINERY PHOTOGRAPHS

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 various 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