

CONTENTS

	Page
Introduction	1
Chapter 1 – Crude Oils	3
Introduction	3
Sampling	3
Preliminary Evaluation of Assay	4
Full or Comprehensive Evaluation	8
Crude Oil as a Power Generation Fuel	9
Applicable ASTM/IP Standards	12
Bibliography	13
Chapter 2 – Gaseous Fuels and Light Hydrocarbons	14
Introduction	14
Quality Criteria	16
Applicable ASTM Specification	20
Applicable ASTM / IP Standards	20
Bibliography	22
Chapter 3 – Petroleum Solvents	23
Introduction	23
General Uses	23
Product Requirements	23
Types of Hydrocarbons	26
Commercial Hydrocarbon Solvents	29
Test Methods for Solvents	32
Applicable ASTM Specifications	36
Applicable ASTM / IP Standards	36
Bibliography	40
Chapter 4 – Automotive Gasoline	41
Introduction	41
Grades of Gasoline	41
Automotive Gasoline Performance and Information system	42
Antiknock Quality	42
Volatility	44
Other Properties	47
Applicable ASTM Specification	50
Applicable ASTM / IP Standards	51
Bibliography	51
Chapter 5 – Aviation Fuels	53
Introduction	53
Historical Development of Aviation Fuels	54
Aviation Gasoline	54
Aviation Turbine Fuels (Jet Fuels)	62
Aviation Fuel Additives	75
Additive Tests	80
Applicable ASTM Specifications	81
Applicable ASTM / IP Standards	81
Bibliography	83
Appendixes	83

Chapter 6 – Diesel Engine and Nonaviation Gas Turbine Fuels	85
Introduction	85
Combustion Process	87
General Fuel Characteristics and Classifications	90
Fuel Properties and Tests	93
Applicable ASTM Specifications	110
Applicable ASTM / IP Standards	110
Bibliography	111
Chapter 7 – Heating and Power Generation Fuel	112
Introduction	112
Burning Equipment	116
Fuel Oil Classification and Specifications	120
Fuel Oil Laboratory Tests and Their Significance	121
Domestic Heating Oil Performance Evaluation	133
Kerosine Performance Evaluation	133
Applicable ASTM Specification	136
Applicable ASTM / IP Standards	136
Bibliography	137
Chapter 8 – Lubricating Oils	138
Introduction	138
Composition and manufacture	140
General Properties	140
Automotive Engine Oils	145
Marine Diesel Engine Oils	148
Industrial and Railway Engine Oils	150
Gas-turbine Lubricants	150
Gas Engine Oils	153
Gear Oils	154
Automatic Transmission Fluids	156
Steam-Turbine Oils	157
Hydraulic Oils	158
Other Lubricating Oils	159
Applicable ASTM / IP Standards	161
Bibliography	163
Chapter 9 – Lubricating Greases	164
Introduction	164
Composition	164
Properties	165
Evaluation of Properties and Significance	166
Applicable ASTM / IP Standards	177
Bibliography	177
Chapter 10 – Petroleum Waxes, Including Petroleum	179
Introduction	179
Occurrence and Refining of Waxes	179
Definitions	180
Applications for Wax	181
Quality Criteria	181
Test methods	188
Inspections of Typical Petroleum Waxes	196
Applicable ASTM / IP Standards	196
Bibliography	197
Chapter 11 – White Mineral oils	198
Introduction	198
Manufacture	198
Purity Guardianship	199

Assessment of Quality	199
Applicable ASTM / IP Standards	206
Bibliography	206
Chapter 12 – Petroleum Oils for Rubber	208
Introduction	208
Historical Background	208
Importance of composition to Compounders	211
Classification of Rubber Oils	212
Physical Properties of Rubber Oils	213
Specialty Application of Process Oils	215
Applicable ASTM / IP Standards	215
References	216