

# Synthetic Lubricants and High-Performance Functional Fluids (Chemical Industries)

Chapter 17

## SYNTHETIC LUBRICANT BASE STOCK PROCESSES AND PRODUCTS

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### 1. INTRODUCTION

This chapter reviews the product and process for synthetic base stocks produced from chemicals of well-defined chemical structures and in processes tailored to optimize important properties and performance features. These synthetic base stocks are critical components used in the formulation of many synthetic lubricants. (In this chapter, we use "synthetic base stock" to represent the base fluid and "synthetic lubricant" to represent formulated, finished lubricant product.)

At the start of this chapter, we briefly discuss the background and the driving force for using synthetic lubricants. The major part of the chapter discusses the key synthetic base stocks - chemistry, synthesis processes, properties, their applications in synthetic lubricant formulation and advantages compared to petroleum-derived base stocks.

Many U.S. base oil manufacturers and formulators include some Group II<sup>+</sup> and Group III base stocks as synthetic, as their manufacturing process includes varying degrees of chemical transformation. These base stocks are usually produced by hydroprocessing or hydroisomerization, which is typically part of a refining process<sup>1</sup>. Discussion of these hydroprocessed base stocks can be found in the previous chapter. In this chapter, we limit discussion to those synthetic base stocks produced from chemicals of well-defined composition and structure.

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