Agilent Model 355 Sulfur Chemiluminescence Detector (SCD): Sulfur Simulated Distillation

Technical Overview

Introduction

This technical overview briefly describes the determination of sulfur boiling point distribution and total sulfur content of petroleum and petrochemical products that fall within the scope of ASTM D 2887.

Sulfur simulated distillation is a useful tool to help meet sulfur specifications for numerous products through better process optimization and understanding. Sulfur simulated distillation may be carried out using various detectors and techniques, but utilization of sulfur simulated distillation has largely been limited to research laboratories. The fact that sulfur levels in crude oils are continually rising, coupled with the fact that environmental regulations require lower levels of sulfur in products, makes the implementation of sulfur simulated distillation in plant laboratories more desirable than ever before. Through the use of the right hardware and software, accurate and precise results from sulfur simulated distillation can be obtained for petrochemical products that fall within the scope of ASTM D 2887. For this broad range of samples, a gas chromatograph with electronic pressure control, a cool-on-column injector, D 2887 capillary column, flame ionization detector (FID), and a sulfur chemiluminescence detector with FID adapter produce the best results. Use of simulated distillation software, such as SimDis Expert from Separation Systems, is also required. The following examples are illustrative of the type of results that can be obtained. Additional details may be obtained from Agilent.

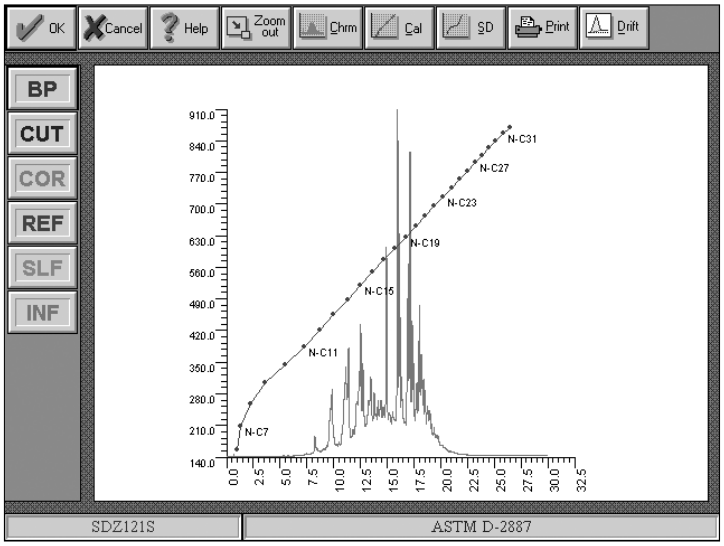

Figure 1. SCD simulated distillation chromatogram of NIST 1624b.

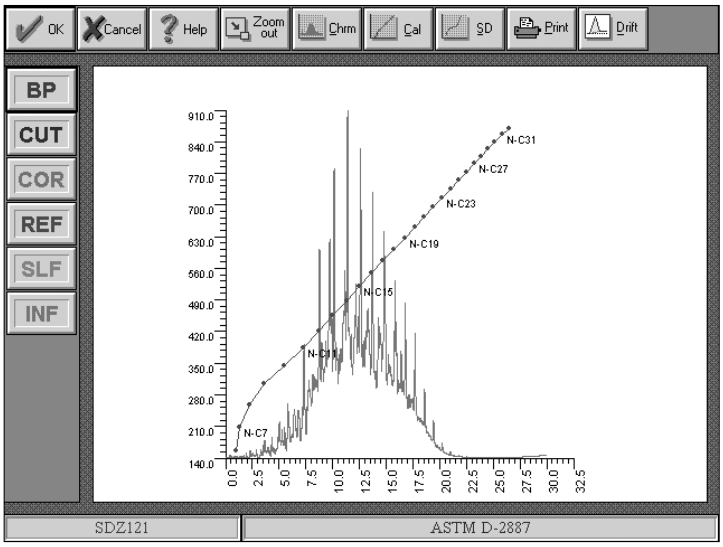

Figure 2. FID simulated distillation chromatogram of NIST 1624b.

Table 1. Simulated Distillation Data on Sulfur Boiling Point of NIST 1624b

Replicate	IBP (°C)	5% off (°C)	50% off (°C)	95% off (°C)	FBP (°C)
1	196.9	231.9	310.1	366.4	430.4
2	196.6	232.5	313.6	367.7	437.7
3	196.6	232.2	313.6	368.3	440.7

Table 2. Simulated Distillation Data on Hydrocarbon Boiling Point of NIST 1624b

Replicate	IBP (°C)	5% off (°C)	50% off (°C)	95% off (°C)	FBP (°C)
1	150.8	189.9	268.0	347.2	380.3
2	150.6	189.9	268.0	347.3	380.5
3	150.7	190.0	268.2	347.4	380.6

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