

Analysis of Sudan Red in Diesel Oil using HPLC

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Abstract

Sudan red is an azo-dye used as the coloring agent for diesel. The coloring of mineral oil products is done to prevent misuse, for example, the prevention of fuel oil from being used in diesel motors. In Germany, fuel oil is less expensive than diesel because of added taxes. Governmental institutions have created legislation which has forced manufacturers to color the more expensive diesel so that it can be identified with a visual inspection. In some cases, the diesel fuel may have darkened , making visual inspection impossible. In these cases HPLC can be used to identify and quantify sudan red.

Method Performance

Figure 1 shows the HPLC chromatogram for the dieselsample with sudan red. The visual inspection was impossible, as the diesel oil color was nearly black. For additional identification, a spectrum can be taken which can be compared to the standard spectrum. In order to



Figure 1 Analysis of sudan red in diesel oil



Conditions

Column 100 x 4 mm Hypersil BDS, 3 μm **Mobile Phase** A = Water, pH = 2.16 with H₂SO₄, B = Acetonitrile **Gradient** at start 70 % B, at 10 min 99 %B **Post Time** 4 min **Flow Rate** 0.8 ml/min **Oven Temp** 35 °C **Injection Vol** 5 μl **Diode array** 535/40 nm **Detector** Reference 700/100 nm



Agilent Technologies Innovating the HP Way obtain a complete spectrum (figure 2), and to set a reasonable reference wavelength, the wavelength range of the diode array detector used should be greater than 600 nm.

Method performance

LOD: 0.8 to 0.9 ng for signal/noise = 2 red RT ~0.2 % rsd area < 1 % linearity = min 1 ng to 1 ug



Figure 2 Spectra of sudan colors

Equipment

Agilent 1100 Series

- degasser
- quaternary pump
- autosampler
- thermostatted column compartment
- diode array detector Agilent ChemStation + software



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