Ministry of Higher Education and Scientific Research
AL Mustaqbal university college
Chemical Engineering Department

Petroleum Properties Laboratory

2nd. Stage.

Exp. No. 1
Petroleum Products Color Tester

Prepared by
Asst.lect. Ban Ali Hassan

2021-2022

Purpose of this test:

the purpose of this test to determine color of various lubricating oils and other petroleum products.

Introduction

The instrument is suitable to determine the color of various lubricating oils and other petroleum products as per industrial standard of China SH/T 0168-92 Standard Test Method for Color of Petroleum Products. The test methods are as follows: Fill test sample into color comparing tube and compare sample color with standard color to ascertain its color number. Please see the attached color number comparing sheet to find out the similarity between the color number of the instrument and color number in standard GB/T6540.

theory :

Determination of Color of petroleum products is mainly used for manufacturing control purposes and it is an important quality characteristic as it can be readily observed by the user of the product. In some cases, color may also serve as an indication of the degree of refinement of the material. When the Color range of the particular product is known, a variation outside the established range may indicate possible contamination with another product. Normally low ASTM Color refers to light product and high ASTM Color refers to heavy product. ASTM Color ranges between 0.5 and 8 and product of Color darker than 8 needs to be diluted with Kerosene. However, color is not always a reliable guide to product quality and should not be used indiscriminately in product specifications. Several color scales are used for determination:

ASTM Color	D 1500
Gardner Color	D 1544
Platinum-Cobalt Color	D 1209

Saybolt Color D 156

Comparison of color values obtained by different methods is shown in Fig. 1..

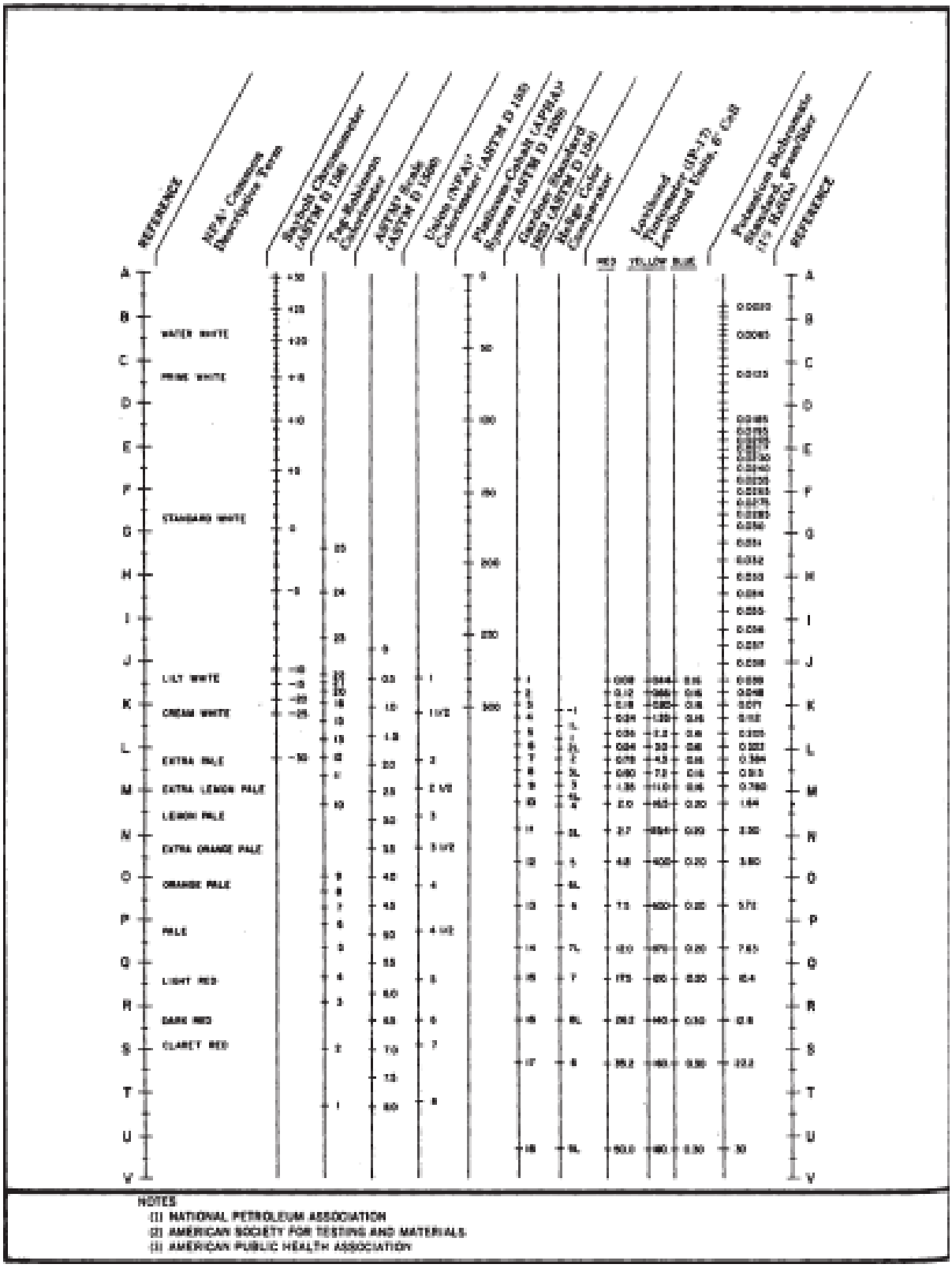


Fig.1: Color scale comparisons for approximate conversions..

Significance and Use:

Determination of the color of petroleum products is used mainly for manufacturing control purposes and is an important quality characteristic, since color is readily observed by the user of the product. In some cases, the color may serve as an indication of the degree of refinement of the material. When the color range of a particular product is known, a variation outside the established range may indicate possible contamination with another product. However, color is not always a reliable guide to product quality and should not be used indiscriminately in product specifications.

Main technical specifications:

1. The instrument is composed of the standard color dial, observation lens, light source and color comparing tube.
2. The light source is a 220 V, 100 W, with a temperature of 2750±50 K grinding milk white light bulb. After filtering color by milk white glass and sunshine filtering glass, the spectrum characteristics of light gained from sunshine is similar to it. The standard light will change into two parallel lights, which is similar in size, through plane reflection mirror, and prism. The parallel lights will irradiate on a sample in the color comparing tube on the color glass of standard color dial evenly and respectively.
3. There are 26 pieces of Φ14 light holes. And standard color glasses having 1～25 color number are installed in the 25 of these holes in sequence. The 26 hole is blank. The color dial is rotated by a hand wheel installed at right side of the instrument to choose the correct color during color comparing test. The standard color comparing glass on the color dial should be calibrated by standard color comparing liquids.
4. The color comparing tube is Φ32 mm, 120～130 mm high non-colorful flat bottom glass tube. The color comparing tube is

placed into the instrument through a lid on the top of the instrument.
5. The observation lens is composed of a concave mirror and separated bar. You can see two semi-circle colors through observation lens. The right semicircle is the standard color. The light and focus of optical observation lens can be adjusted, so it is easy to be used.

SYD-0168 Petroleum Products Color Tester

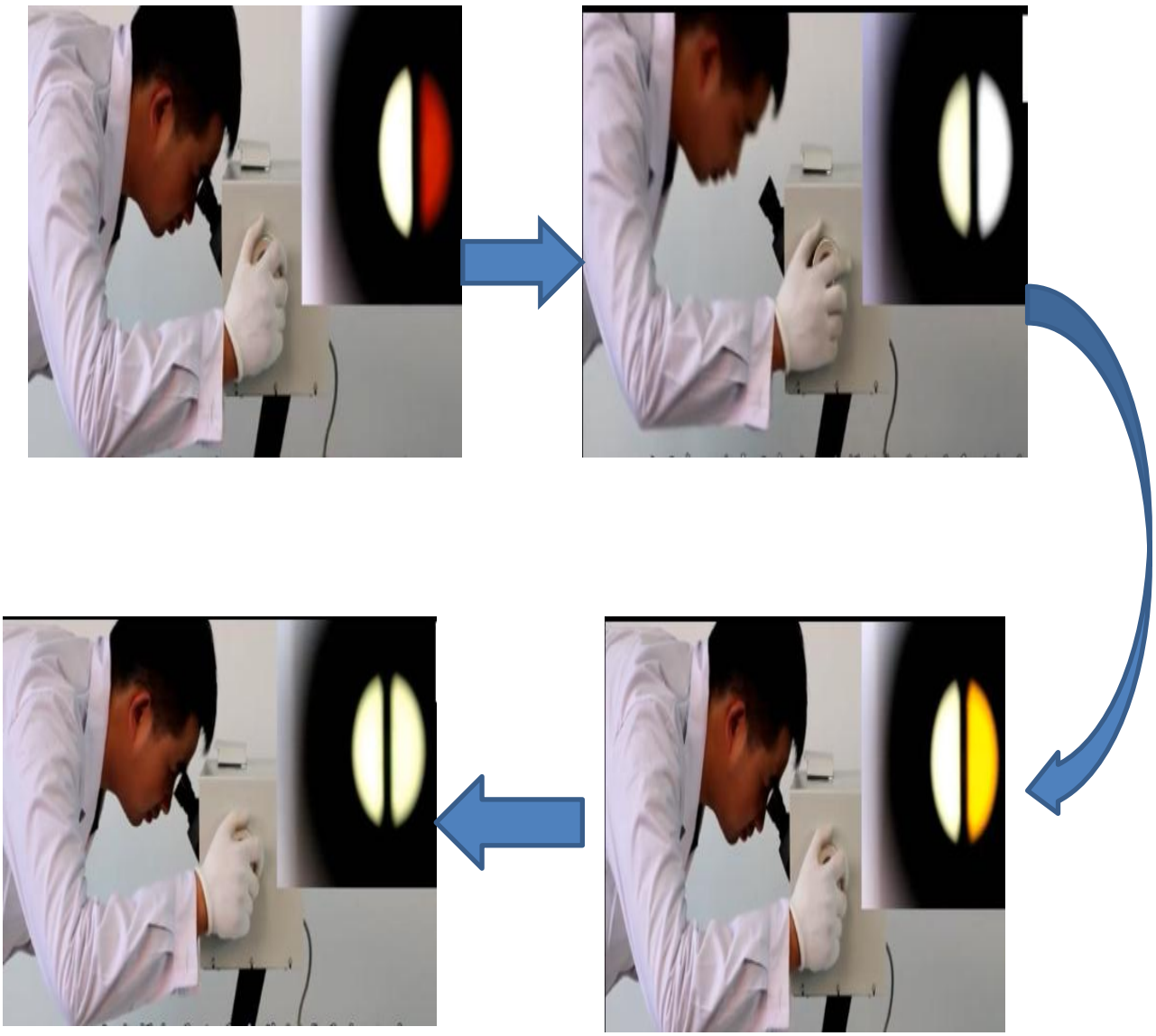
Procedure:

1 - Place a sample container or containers, filled to a depth of at least 50 mm with distilled or deionized water, in the compartment or compartments of the colorimeter through which the standard glasses will be observed. Place the sample in its container in the other compartment. (When using a three-field comparator, this will be the middle compartment.) Cover the containers to exclude all exterior light.
2 - Switch on the light source and compare the color of the sample with that of the standard glasses. When using a three-field comparator, the sample must be bracketed by darker and lighter discs or by an exact match and a darker disc.

Determine for two-field comparators which glass matches the color of the sample; or if an exact match is not possible, then use that glass which possesses the next darker color.

Comparison table between the color number of the instrument (SH/T0168 color number) and the color number of GB/T6540 (ISO color number)

The color number of the instrument (SH T0168 color number)	GB T6540 color number (ISO color number)
0	0
5	0.5
7	1.0
9	1.5
11	2.0
13	2.5
15	3.0
16	3.5
17	4.0
18	4.5
19	5.0
20	5.5
21	6.0
22	6.5
23	7.0
24	7.5
25	8.0



Discussion:

1-What is the purpose of this test ?
2- What is the benefit of knowing the degree of color ?
3-What are the oil products that can be tested with the device ?
4-What are the main device parts ?