

KES

Test Method for Refraction
Index and Non-dispersion
of Petroleum

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1. Scope of Application

This standard shall specify the test of refraction index and non-dispersion for electrically insulated oil.

2. Significance of Test

The refraction index varies with respect to the composition of insulated oil and the quantity of impure contents in oil.

If the refraction index is pre-known, the composition change or degree of pollution after use can be expected.

When the non-dispersion is employed under high electric potential conditions of insulated oil, it is employed as sensitivity to the quantity of aromatic chemicals, which is related to the stability. Non-dispersion value of insulated oil is determined by structure & quantity of aromatic chemicals in the oil.

If the quantity of aromatic chemicals increases, the non-dispersion value normally increases. If the axis-loop type aromatic chemical is added to the aromatic chemical, the non-dispersion value increases.

Therefore, the insulated oil with high non-dispersion value is more stable under high electric potential conditions. For example, the generated quantity of hydrogen gas is little when it is exposed to the corona electric discharge.

3. Meaning of Terminology

(1) Refraction index : The refraction index of inspected liquid is the value, where sine of incidence angle is divided by sine of refraction angle when the light is refracted on the boundary of air and inspected liquid. The refraction index varies with respect to the temperature of light's wavelength.

It is accurately referred to the refraction index of inspected liquid to the air and the refraction index to the vacuum is absolute refraction index.

The absolute refraction index of inspected liquid is calculated by of relative refraction index & absolute refraction index 1.00027 of air.

- (2) Non-dispersion : The non-dispersion is the value, where average dispersion is divided by specific gravity under same temperature of same specimen. Then, the obtained value is represented as 10^4 times for convenience.
- (3) Average dispersion: The average dispersion is difference of each refraction index on the same temperature to F line & C line of Hopper line.

4. Summary of Test Method

The non-dispersion is that the test can be divided by average dispersion & 2 times of specific gravity. There are pull-free refraction meter and Abbe refraction meter as test apparatus of average dispersion. Normally, the electronic is appropriate for precise measurement.

The 2nd is originally measured the refraction index (N.D) to sodium D line using white light. However, it should have the equipment to draw back the white light as a compensator with containing light dispersion by specimen & prism so that the average dispersion can be measured by it.

5. Preparation of Specimen

When there is one, which contains humidity or has curiosity to have humidity, it is dried by dry filter or calcium chloride.

6. Standard Glass Piece

The standard glass piece is employed 3 types as table 1.