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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 21216-2007

**Insulating liquids -- Determination of the dielectric dissipation
factor by measurement of the conductance and capacitance --
Test method**

绝缘液体 测量电导和电容确定介质损耗因数的试验方法

(English Translation)

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Foreword

This standard is identical with IEC 61620:1998 "insulating liquid measuring conductance and capacitance - Test method to determine the dielectric loss factor" (English Chinese Version).

For ease of use, this standard and IEC 61620:1998 as compared to doing the following editorial changes.

- a) Delete the international standard "foreword";
- b) use the decimal symbol '. 'Decimal symbol instead of ' ';
- c) with the "V/mm" instead of "Vmm-1", "S/m" instead of "Sm-1", "kV/cm" instead of "kVcm-1";
- d) Delete "Normative references" in reference to the standard "IEC 60475 dielectric liquid sampling method" because it is included in the GB/T 5654-2007 in.

This standard Annex A, Annex B is normative appendix, Appendix C is informative appendix.

The standard proposed by China Electrical Equipment Industrial Association.

This standard by the National Standardization Technical Committee of the insulating material (SAC/TC51) centralized.

This standard was drafted. Guilin Electrical Apparatus Research Institute, Xi'an Jiaotong University.

Introduction

Only under conditions of thermodynamic equilibrium measured conductivity σ it can only be regarded as a characteristic parameter of the insulating liquid.

To meet this requirement, should avoid high electric field intensity and/or duration voltage is

applied, this case differs from the GB/T 5654-2007 in DC resistivity measurement (electric field strength up to 250V/mm, the charging time of 1min).

Most electrical dipole in the absence of liquid loss, the dielectric loss factor $\tan\delta$, the conductivity σ and the relative permittivity ϵ Inter satisfies the following relationship.

$\tan\delta = \sigma \epsilon \omega$ Thus, by measuring the $\tan\delta$ or conductivity σ can get performance liquid. In fact, the use of conventional instrument $\tan\delta$ measured after conversion to the resistivity between very different according to GB/T 5654-2007 measured DC resistivity.

Measure the conductivity σ under thermodynamic equilibrium conditions the new instrument of universal application. This convenient measuring instrument and get accurate the small σ value, the new instruments can even measure σ unused insulating liquid at room temperature.

GB/T 21216-2007/IEC 61620:1998 Insulating liquid measuring conductance and capacitance dielectric loss determined Factor Test Method

1 Scope

This standard describes the dielectric loss factor $\tan\delta$ of the insulating liquid measuring method, the method by simultaneous measurement of capacitance and conductance G After C by the conversion to give $\tan\delta$, this standard applies to unused insulating liquids and the operation of transformers or other electrical equipment used Insulating liquid.

Although this standard applies to all liquids GB/T 5654-2007 mentioned, even high insulation performance of the liquid, but the standard is not You can replace GB/T 5654-2007. The method can accurately measure down to 10^{-6} dielectric loss factor at power frequency, the measurement range Between 10^{-6} and 1, under special conditions up to 200.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard. However, according to research encourages the parties to the agreement Study whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB/T 5654-2007 Measurement of liquid insulating material of relative permittivity, dielectric dissipation factor and dc resistivity (IEC 60247.

2004, IDT)

GB/T 6379.1-2004 measurement methods and results accuracy - Part 1. General principles and definitions (ISO 5725-1:1994, IDT) GB/T 6379.2-2004 measurement methods and results accuracy - Part 2. Determine the repeatability and reproducibility of a standard measurement method the basic method of (ISO 5725-2:1994, IDT) ISO 5725-3:1994 Measurement methods and results accuracy - Part 3. Standard Methods of measurement precision intermediate measure ISO 5725-4:1994 Measurement methods and results - Part 4 Accuracy. determine the basic method of standard methods of measurement accuracy

3 Definitions

The following definitions apply to this standard.

Conduction current amount of a scalar or matrix density j and the electric field strength E ratio, the relationship is.

$$J = \sigma E$$

The reciprocal of conductivity, are as follows.

$$\rho =$$

Resistance test cell filled with a liquid sample is applied to the test voltage U Ikegami and DC current or the ratio of the phase current I_R , GB/T 21216-2007/IEC 61620:1998