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

GB/T 14455.3-2008

**Fragrance/Flavor substances -- Evaluation of solubility
(miscibility) in ethanol
(English Translation)**

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1 Scope

This Part of GB/T 14455 specifies the method for the evaluation of miscibility of essential oils in aqueous ethanol solution with an already-known content and the method for the determination of solubility of isolate and synthetic fragrances in aqueous ethanol solution with an already-known content.

This Part is applicable to the evaluation of miscibility of essential oils and the determination of solubility of isolate and synthetic fragrances.

2 Normative References

Through the reference in this Part of GB/T 14455, the clauses of the following documents become clauses of this Part. In terms of references with a specified date, all the subsequent modification sheets (excluding the corrected content) or revised versions are not applicable to this Part. However, the various parties that reach an agreement in accordance with this Part are encouraged to explore the possibility of adopting the latest version of these documents. In terms of references without a specified date, the latest version is applicable to this Part.

GB/T 14454.1 Fragrance / Flavor Substances - Preparation of Test Samples (GB/T 14454.1-2008, ISO 356:1996, MOD)

3.1 Miscibility of Essential Oils in Ethanol

At 20 °C, gradually add aqueous ethanol solution of an appropriate concentration to essential oils; evaluate the miscibility and possible lacteous phenomenon.

3.2 Solubility of Isolate and Synthetic Fragrances in Ethanol

At 25 °C, various isolate and synthetic fragrances in different concentrations of aqueous ethanol solution have different solubilities.

NOTE: solubility refers to the milliliters of aqueous ethanol solution required when at a specified temperature, 1 mL or 1 g of isolate and synthetic fragrances are completely solubilized in a certain concentration of aqueous ethanol solution.

4 Classification of Miscibility

4.1

At 20 °C, when a volume of certain essential oil is mixed with V volume of aqueous ethanol solution with a certain concentration, and then, becomes clear and transparent, then, gradually add the aqueous ethanol solution of that concentration, till the volume of ethanol becomes 20, if it can still remain clear and transparent, then, it is believed that this essential oil is miscible with V volume or a larger volume of aqueous ethanol solution with that concentration.

4.2

At 20 °C, when a volume of certain essential oil is mixed with V volume of aqueous ethanol solution with a certain concentration, and then, becomes clear and transparent, but after gradually adding (V -V) volume of aqueous ethanol solution with that concentration, it becomes turbid; and when the volume of ethanol becomes 20, it still remains turbid, then, it is believed that this essential oil is miscible with V volume of aqueous ethanol solution with that concentration, and becomes turbid when it is diluted to the volume of V .

4.3

At 20 °C, when a volume of certain essential oil is mixed with V volume of aqueous ethanol solution with a certain concentration, and then, becomes clear and transparent, but after gradually adding (V -V) volume of aqueous ethanol solution with that concentration, it becomes turbid; and after further adding (V -V) volume of aqueous ethanol solution with that concentration, it becomes clear and transparent, then, it is believed that this essential oil is miscible with V volume of aqueous ethanol solution with that concentration, and becomes turbid when it is diluted to the volume of V , till it reaches V .

4.4 After mixing an essential oil with a certain concentration of aqueous ethanol

solution (accordance with the conditions specified in 4.1, 4.2 and 4.3), it becomes lacteous. If this lacteous color is the same as the freshly prepared lacteous standard solution specified in 5.3, then, it is believed that this essential oil is miscible with this concentration of aqueous ethanol solution to form a lacteous solution.

NOTE: the value of V_1 , V_2 and V_3 are not more than 20.

5 Reagents

All the used reagents are analytically pure; water is distilled water or water of equivalent purity.

5.1 95% (volume fraction) ethanol.

5.2 Aqueous ethanol solution: generally used aqueous ethanol solution, the content of

ethanol (volume fraction) is: 50%, 55%, 60%, 65%, 70%, 75%, 80%, 85%, 90% and 95%.

5.3.

8.3 Determination of Solubility of Isolate and Synthetic Fragrances

Use burette (6.1) to add aqueous ethanol solution (5.2) which is pre-adjusted to 25 °C $\pm$ 0.2 °C with an already-known concentration to the sample. Each time, add 0.1 mL; vigorously shake it, till it completely solubilizes. When the solution becomes clear and transparent, record the milliliters of the added aqueous ethanol solution, which is the solubility. Or, in accordance with the stipulations of solubility in product standards regarding fragrances, at a time, add aqueous ethanol solution of specified concentration and volume; preserve the heat and shake it for a while. If a clear and transparent solution is obtained, then, it shall be qualified.

NOTE 1: the determination of solubility generally uses ethanol as the solvent. When other solvents are used, it shall be pointed out in the product standards regarding fragrances.

NOTE 2: during the determination, if a certain concentration of aqueous ethanol solution is added to 10 mL, the clear and transparent solution still cannot be obtained, then, use a more concentrated level of aqueous ethanol solution in Table 1 for re-determination.

9.1 Miscibility of Essential Oils

At 20 °C, the miscibility of essential oils and aqueous ethanol solution (see Table 1) with the concentration of Q is expressed as follows:

a) Circumstance 1 (4.1):

1 volume of essential oil solubilizes in V volume of aqueous ethanol solution with the concentration of Q;

b) Circumstance 2 (4.2):

1 volume of essential oil solubilizes in V volume of aqueous ethanol solution with the concentration of Q, while manifests turbidity in V volume of aqueous ethanol solution with the same concentration;

c) Circumstance 3 (4.3):

1 volume of essential oil solubilizes in V volume of aqueous ethanol solution with the concentration of Q, while manifests turbidity in V to V volume of aqueous ethanol solution with the same concentration;

In which,

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