Designation: D 2083 – 92 (Reapproved 1998)

Standard Test Method for Calculation of Percent of Primary, Secondary, and Tertiary Amines in Fatty Amines[1]

This standard is issued under the fixed designation D 2083; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This method was prepared jointly by the American Society for Testing and Materials and the American Oil Chemists' Society.

1. Scope

1.1 This test method covers calculation of the percent of primary, secondary, and tertiary amines in the sample from determinations of primary, secondary, and tertiary amine values and percent of non-amine.

1.2 This test method is applicable to materials containing only fatty primary amines, difatty secondary amines, trifatty tertiary amines, and nonamines. This method is not applicable to blends such as a mixture of coco primary amine and tallow difatty secondary amine.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 2073 Test Methods for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines, Amidoamines, and Diamines by Referee Potentiometric Method[2]

D 2074 Test Methods for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method[2]

D 2082 Test Method for Percent of Non-Amines in Fatty Nitrogen Compounds[2]

3. Procedure

3.1 Determine primary, secondary, and tertiary amine values in accordance with Test Methods D 2073 or D 2074.

3.2 Determine the percent of non-amines in accordance with Test Method D 2082.

4. Calculation

4.1 Calculate the percent of amines as follows (Note):

where:

Let X = average molecular weight of the primary amine,
PAV = primary amine value of the sample,
SAV = secondary amine value of the sample,
TAV = tertiary amine values of the sample, and
PNA = %non-amine.

then:

$$X = \frac{561(100 - PNA) + 17(SAV) + 34(TAV)}{PAV + 2(SAV) + 3(TAV)} \quad (1)$$

and

$$\text{Primary amine, \%} = PAV(X)/561 \quad (2)$$

$$\text{Secondary amine, \%} = SAV(2X - 17)/561$$

$$\text{Tertiary amine, \%} = TAV(3X - 34)/561$$

NOTE 1—The equations given in 4.1 are based upon the assumption that the alkyl chain lengths in the monofatty, difatty, and trifatty amines are the same average length.

5. Precision and Bias

5.1 Precision and bias were not established at the time this test method was written. An effort is being made to obtain the precision and, if obtainable, it will be published in future revisions. This test method has been in use for many years, and its usefulness has been well established.

6. Keywords

6.1 amines; fatty amines

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[1] This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.32 on Drying Oils.

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[2] *Annual Book of ASTM Standards*, Vol 06.03.

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