Designation: E1116 – 98 (Reapproved 2014)

Standard Test Method for Emulsification Characteristics of Pesticide Emulsifiable Concentrates[1]

This standard is issued under the fixed designation E1116; 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.

1. Scope

1.1 This test method describes a general procedure for the determination of emulsification spontaneity and the emulsion stability characteristics of pesticide emulsifiable concentrates when diluted with water.

1.2 Proper safety and hygiene precautions must be taken when working with pesticide formulations to prevent skin or eye contact, vapor inhalation, and environmental contamination. Read and follow all handling instructions for the specific formulation and conduct the test in accordance with good laboratory practice.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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:*[2]

D1126 Test Method for Hardness in Water

D1193 Specification for Reagent Water

3. Terminology

3.1 *Definitions:*

3.1.1 *emulsification spontaneity*——the rapid formation of an emulsion in the test water from agitation provided only by the gravity addition of the product. For products of density greater than the water used, an excellent spontaneity rating is assigned when the emulsion bloom (billowing) extends downward to near the bottom of the water, with no visible oil or cream droplets reaching the bottom of the test cylinder. For products of density less than the water used, a rating of excellent is given if bloom occurs near the top of the water and no free oil is present. Spontaneity descriptions between excellent and nil (no emulsion formed, only free oil) are assigned very-good, fair, and poor on a subjective basis.

3.1.2 *emulsion quality*—a subjective evaluation of the emulsion appearance. A rating of excellent (homogeneous), very good, good, fair, and poor (nonhomogeneous) is assigned.

3.1.2.1 *Discussion*—Cream and oil separation may coexist. Normally, oil is located at either the extreme top or bottom of the liquid with cream between it and the rest of the emulsion. On rare occasions, separation occurs at both top and bottom of the liquid (because of partition and solubility properties) and care must be taken to so note and record.

3.2 *Separation:*

3.2.1 *separation, cream*—a discrete, opaque layer of concentrated emulsion occurring at either the top or the bottom of the liquid.

3.2.2 *separation, oil*—a discrete layer of nonemulsified liquid occurring at either the top or the bottom of the liquid.

4. Summary of Test Method

4.1 In this test method, emulsifiable pesticide concentrates are added to water of a given hardness and at a specified temperature to form an oil-in-water emulsion. Performance of the formulation is measured in terms of emulsion spontaneity, emulsion stability under static conditions, and re-emulsification of the coalesced phase.

5. Significance and Use

5.1 This test method provides a guide for evaluating emulsification characteristics of pesticide emulsifiable concentrates. It defines the stability of emulsified particles in water. Although not absolute, the test method is a measure of expected emulsion stability in agricultural application equipment.

6. Apparatus

6.1 *Analytical Balance*, accurate to 0.01 g.

6.2 *Burets*, 50 and 100-mL capacity.

[1] This test method is under the jurisdiction of ASTM Committee E35 on Pesticides, Antimicrobials, and Alternative Control Agentsand is the direct responsibility of Subcommittee E35.22 on Pesticide Formulations and Delivery Systems.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.