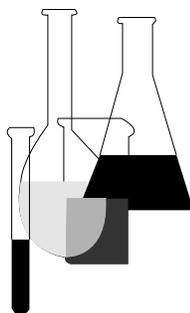




Product Properties Test Guidelines

OPPTS 830.6314

Oxidation/Reduction: Chemical Incompatibility



INTRODUCTION

This guideline is one of a series of test guidelines that have been developed by the Office of Prevention, Pesticides and Toxic Substances, United States Environmental Protection Agency for use in the testing of pesticides and toxic substances, and the development of test data that must be submitted to the Agency for review under Federal regulations.

The Office of Prevention, Pesticides and Toxic Substances (OPPTS) has developed this guideline through a process of harmonization that blended the testing guidance and requirements that existed in the Office of Pollution Prevention and Toxics (OPPT) and appeared in Title 40, Chapter I, Subchapter R of the Code of Federal Regulations (CFR), the Office of Pesticide Programs (OPP) which appeared in publications of the National Technical Information Service (NTIS) and the guidelines published by the Organization for Economic Cooperation and Development (OECD).

The purpose of harmonizing these guidelines into a single set of OPPTS guidelines is to minimize variations among the testing procedures that must be performed to meet the data requirements of the U. S. Environmental Protection Agency under the Toxic Substances Control Act (15 U.S.C. 2601) and the Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136, *et seq.*).

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OPPTS 830.6314 Oxidation/reduction: Chemical incompatibility.

(a) **Scope**—(1) **Applicability.** This guideline is intended to meet testing requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 U.S.C. 136, *et seq.*).

(2) **Background.** The source material used in developing this harmonized OPPTS test guideline is OPP guideline 63–14 Oxidizing or reducing action (Pesticide Assessment Guidelines, Subdivision D: Product Chemistry, EPA Report 540/9–82–018, October 1982) and 40 CFR 158.190 Physical and chemical characteristics.

(b) **Test method**—(1) **Objectives.** (i) Chemical incompatibility determines the likelihood of violent reactions occurring when the new chemical is mixed or comes into contact with other substances. Thus, dangerous contact during its chemical life (manufacturing, processing, distribution, storage, use, and disposal) can be avoided. Significant temperature increases, evolution of gases, noxious fumes, splattering, and evolution of flame are possible dangers. As used here, “significant temperature increases” is defined as an increase of 5 °C or more.

(ii) These tests will indicate hazardous reactions which can occur resulting from contact of the chemical with common oxidizing and reducing agents, common fire extinguishing agents, and common solvents.

(2) **Test details.** (i) Information on the oxidation or reduction potential of a product may be obtained through a knowledge of the chemistry of the product and/or by application of the method described in 44 FR 16267 (1979) (see paragraph (d)(1) of this guideline) which is presented, with minor changes, in paragraph (b)(2)(ii) of this guideline.

(ii) This qualitative assessment will vary from chemical to chemical depending on physical state and intended uses. Subjective judgements by a chemist familiar with the chemical and its intended uses are needed to select appropriate protocols. The following is only an example of an appropriate set of tests for a hypothetical chemical. All temperature increases of greater than 5 °C should be noted. Tests should be conducted at temperatures expected during the normal use of the chemical. Generally, the ratio of the mass of the new chemical to the mass of the chosen reactant should be high, simulating maximum exposure situations.

(A) The chemical should be placed in contact with water for 24 hours and visual observations recorded.

(B) The chemical should be placed in contact with carbon dioxide and/or monoammonium phosphate for 24 hours and visual observations recorded. Both of these compounds are widely used fire extinguishing agents.

(C) For reducing agents, the chemical should be placed in contact with powdered zinc or iron for 24 hours and observations recorded. Elemental zinc and iron are both moderately strong reducing agents. Data from corrosion tests or stability to metals may be suitable in lieu of this test.

(D) For oxidizing agents, the chemical should be placed in contact with a moderately strong oxidizing agent, one which the chemical may contact in its intended use. The electrochemical series may be used as a guide (the Handbook of Chemistry and Physics, for example, provides information on suitable agents, see paragraph (d)(2) of this guideline).

(E) If the chemical is intended for use in households it should be placed in contact with a household organic solvent, such as kerosene, turpentine, or gasoline, for 24 hours and observations recorded.

(iii) If an alternative method is used, it is recommended that the registrant consult with the agency prior to adopting the test method.

(c) **Reporting.** (1) Descriptions and results of all tests should be provided.

(2) Any methods used to characterize the physical properties of a pesticide shall be referenced or described in the application for registration. If the methods used are listed in paragraph (d) of this guideline, reference to the method will suffice. If other methods are used, copies of such methods must be submitted with the application.

(3) The applicant shall submit his own statistical evaluation of the precision and accuracy of these measurements (e.g., standard deviations or confidence intervals) when appropriate.

(d) **References.** The following references should be consulted for additional background material on this test guideline.

(1) EPA, "Chemical Incompatibility," FEDERAL REGISTER, 44 FR 16267 (1979).

(2) *Handbook of Chemistry and Physics*, CRC Publishing Co., Boca Raton, FL, latest edition.