

Fate, Transport and Transformation Test Guidelines
(835 series): List and Description of New or Significantly
Revised Guidelines

1. OPPT uniques.

Several completely new guidelines representing the best methods currently available in their respective areas have been developed:

1.1 The Activated Sludge Sorption Isotherm Test (835.1110) is a simple and efficient method for determining the sorption potential of activated sludge for specific chemical compounds. As such, it can be utilized to derive an estimate of extent of removal of a chemical substance in activated sludge secondary treatment if sorption is the only significant removal process. Removal in biological treatment is frequently an important determinant of subsequent aquatic and human exposures for TSCA chemicals.

1.2 Hydrolysis as a Function of pH and Temperature (835.2130) is a new guideline that represents an upper-tier test for hydrolysis of specific chemical compounds for which this process is likely to be important. With this guideline it is possible to determine rate constants and half-lives for acid- and base-catalyzed hydrolysis, neutral hydrolysis, and the sum of these individual processes, for any test compound at any desired pH and temperature.

1.3 The Sealed Vessel CO₂ Production Test (835.3120) is a new method for determining ready, aerobic ultimate biodegradability of specific chemical compounds. Ultimate biodegradability is followed by measuring CO₂ production as with the familiar Sturm test (see 2.1.1 below), but the sealed vessel test is simpler and more economical to run due to the design of test vessels and the analytical methods employed for quantification of CO₂. The sealed vessel test provides stringent test conditions similar to those of OECD ready biodegradability tests (see 2.1.1 below), and thus can be thought of as a more economical alternative to those tests. It is already a widely accepted method and is currently in an advanced stage of the balloting process for acceptance as an ASTM standard method.

1.4 The Shake-Flask Die-Away Test (835.3170) is a new guideline for OPPTS, but existed previously as ASTM Standard Test Method E 1279-89. This method is similar to the familiar river die-away test for determining disappearance of test compounds in samples of natural waters, but is superior to the older die-away methods because it incorporates methodologies

for determining the effects of suspended sediment on degradability, as well as measuring ultimate biodegradation.

1.5 The Sediment/Water Microcosm Biodegradation Test (835.3180) also uses natural water and sediment samples, but the purpose of this method is to determine test compound fate in sediment/water cores collected intact from the environment. Using this method the investigator can study processes such as partitioning to benthic sediment in addition to abiotic and biotic degradation. As of 8/95 it was in an advanced stage of the balloting process for acceptance as an ASTM standard method, but by now may have been officially adopted.

1.6 The Porous Pot Test (835.3220) is the last of the all-new guidelines in the 835 series. The Porous Pot Test is a method for determining removal of test compounds in activated sludge secondary treatment that simulates actual treatment conditions. Specifically, the test system is operated on a continuous-feed basis (as in actual treatment, and in contrast to the Semi-Continuous Activated Sludge or SCAS Test), and the porous pot apparatus is both economical and facilitates control of a critical parameter, the sludge retention time. It is currently in an advanced stage of the balloting process for acceptance as an ASTM standard method.

2. OPPT/OECD bilaterals.

2.1 Several guidelines have recently been subjected to major revision by the OECD:

2.1.1 The OECD Ready Biodegradability Tests (OECD 301A,B,C,D,E) recently underwent major revision, and this process did formally include review by OPPTS. The revised guidelines have now been adopted by OPPTS. The new set of "ready" tests includes six different methods (formerly there were 5) which all appear under 835.3110. The ready biodegradability tests include such familiar methods as the long-term BOD (Closed Bottle) and CO₂-evolution (Sturm) tests, and are the most frequently performed of all laboratory biodegradability tests.

2.1.2 The Zahn-Wellens Test (835.3200) is a test for "inherent biodegradability" that has been revised by the OECD to incorporate certain features of the formerly distinct EMPA test (an official Swiss method), and thus is now called the Zahn-Wellens/EMPA test. The Zahn-Wellens/EMPA Test is essentially an activated sludge die-away test. Although not often used under TSCA, the Zahn-Wellens Test has seen frequent use in other OECD countries. As with the ready biodegradability tests, the process for revision of this guideline did formally include OPPTS review.

2.2 Additional guideline for which OPPT dropped its previous test guideline and adopted the OECD version (but the OECD has not recently revised the guideline, in contrast to the situation for the two guidelines just described):

2.2.1 Prior to the test guidelines harmonization program, OPPT's lower-tier test for hydrolysis was the guideline Hydrolysis as a Function of pH at 25 C, found at 796.3500. OPPT has now adopted OECD guideline 111 in its place, and the new OPPTS number is 835.2110. The official name of this guideline is Hydrolysis as a Function of pH, same as OECD 111. The difference between 835.2110 and 835.2130, one of the new OPPT uniques described above, is that 835.2110 is more limited in its scope and less flexible than the upper-tier hydrolysis test method in 835.2130 (see 1.2 above).

3. OPPT/OPP/OECD Trilaterals.

(There are none in the 835 series.)

Peer Review Status of Guidelines in Group 1 (New OPPT Uniques) as of 11 Dec 95

Guideline	Status
835.1110	Activated Sludge Sorption Isotherm: Reviewed informally by several experts in the field; method has also been utilized by commercial testing laboratories and is currently being evaluated.
835.2130	Hydrolysis as a Function of pH and Temperature: Unknown, but the guideline contains relatively minor revisions of well-established test procedures.
835.3120	Sealed Vessel CO ₂ Production Test: Currently in an advanced stage of the ASTM balloting process and therefore already extensively peer-reviewed. Used in many research studies and therefore included in numerous peer-reviewed articles.
835.3170	Shake-Flask Die-Away Test: Extensively reviewed during the lengthy ASTM balloting process (completed). Used in many research studies and therefore included in several peer-reviewed journal articles.

835.3180 Sediment/Water Microcosm Biodegradation
Test:

Currently in an advanced stage of the
ASTM balloting process and therefore
already extensively peer-reviewed.
Used in many research studies and
therefore included in numerous
peer-reviewed articles.

835.3220

Porous Pot Test:
Currently in an advanced stage of the
ASTM balloting process and therefore
already extensively peer-reviewed.
Has been extensively evaluated in testing
laboratories.

The following list includes, all guidelines meeting these
criteria: i) 835 series; ii) not OPP unique; iii) not listed
above (i.e., not new or significantly revised):

1. OPPT uniques.

1.1 835.1210 Soil Thin Layer Chromatography.

1.2 835.2210 Direct Photolysis Rate in Water by
Sunlight.

1.3 835.2220 Indirect Photolysis Rate in Waters
Containing Humic Substances by Sunlight.

1.4 835.2250 Direct Photolysis Rate in Water.
Determination of the Reaction Quantum Yield Using
Monochromatic Light.

1.5 835.2310 Maximum Direct Photolysis Rate in Air from
UV/Visible Spectroscopy.

1.6 835.3100 Aerobic Aquatic Biodegradation.

1.7 835.3400 Anaerobic Biodegradability of Organic
Chemicals.

2. OPPT/OECD bilaterals.

2.1 835.1220 Sediment and soil sorption/desorption
isotherm.

2.2 835.3210 Modified SCAS Test.

2.3 835.3230 Simulation Test--Aerobic Sewage
Treatment--Coupled Units Test.

2.4 835.3300 Soil Biodegradation.