

LABNOTES *Spring 2001 (Addendum)*

The following is the full text of an article summarized in LabNotes Spring 2001.

Hazardous Waste Ignitability & Reactivity Testing

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Since the publication of the article on the ignitability of solids in LabNotes - Fall 1999, EPA has developed method 1050, "Test Methods to Determine Substances Likely to Spontaneously Combust" and method 1040, "Test Method for Oxidizing Solids" that were included in Update IVB of SW-846 (<http://www.epa.gov/sw-846/up4b.htm>). These draft methods have yet to be promulgated for use under NR 149.

The scope and application section of method 1050 says: "*This method may be used to meet certain regulatory applications but is not required for determining if a waste passes or fails the characteristic of ignitability per the RCRA definition.*" There is a three-step hierarchy to determine if a waste is ignitable.

- Test method A can be used to determine if a solid fits the definition of pyrophoric (i.e., spontaneously combustible).
- Test method B is a two-part procedure to determine if liquids can be classified as pyrophoric.
- Test method C is used to determine if a solid self-heats.

A laboratory that is analyzing samples using method 1050 must first attempt test method A as pyrophoric solids may react violently under the conditions of test method C.

Method 1040's scope and application section has the same language as that quoted above from

method 1050. While not required, this method may be useful to determine if a solid has the ignitability characteristic for an oxidizer.

What follows are answers to a couple of questions received in response to the LabNotes Spring 1999 article:

Q: "Part of the Ignitability rule for liquids is the criteria that it contains < 24 % alcohol by volume. There is no method reference or identification of which alcohol(s) are tested for. Would the 'UN Manual of Tests and Criteria' contain this information, or where would you suggest I turn to for the information?"

A: To determine if the aqueous alcohol exception to the ignitability characteristic for a liquid applies, the laboratory must first determine whether the liquid is aqueous. The term aqueous, as used in the ignitability characteristic, means at least 50% water by weight. EPA has developed method 9000, "Determination of Water in Waste Materials by Karl Fischer Titration" and method 9001, "Determination of Water in Waste Materials by Quantitative Calcium Hydride Reaction" to determine if sufficient water is present in the sample to fit the definition of aqueous. The Laboratory Certification Program has not promulgated these methods, which were included in Update IVA of SW-846.

Once you have verified that a sample contains $\geq 50\%$ water, you then determine the percentage of alcohol by volume in that sample. The direct injection techniques for waste samples included in section 7 of methods 8015B and 8260B can be used. Alternatively, consult the Material Safety Data Sheet (MSDS), for specifications of a commercial product. EPA guidance indicates the term alcohol, as used in the ignitability characteristic, refers to *any* alcohol or *combination of* alcohols. This data is

used in conjunction with results from flashpoint analyses to determine if a waste meets the definition of ignitability. Generators must also consider the types of alcohol present in waste streams as some are also regulated as wastes from nonspecific sources, specific sources or are acutely toxic. For example, spent mixtures containing alcohol may also be on the F-list.

Q: “Parts of the reactivity characteristics also list criteria without test references. The list in s. NR 605.08(4) Wis. Adm. Code, Items 1,2,3,4,6 & 7 (contain similar items as 40 CFR Subpart C part 261.23) identifies hazardous conditions that do not directly relate to any known test method (these are everything other than reactive cyanide and sulfide). Because the rules are written such that a waste having 'any' of these reactive characteristics would be considered hazardous, I'm at a loss. Clients look to us to determine if their waste is hazardous. We would like to make that determination but we are unsure what is acceptable? Do you have any suggestions where and how to test for these items? Or redirection?”

A: The hazardous waste reactivity characteristic is defined in s. NR 605.08(4) Wis. Adm. Code. At this time, there are no required test methods for the eight reactivity characteristic properties in paragraph (a).

EPA has withdrawn test methods for reactive cyanide or sulfide-bearing wastes, as detailed in “Withdrawal of Cyanide and Sulfide Reactivity Guidance” LabNotes, Spring 1999 (available

from the Laboratory Certification web site.).

Test methods for detonation, explosive decomposition or reaction (properties 6 and 7) are included in Part I of the “UN Manual of Tests and Criteria” and could be used to determine if a waste will detonate if initiated, heated under confinement or react at 25° C at 1 atmosphere pressure.

The final property references U. S. Department of Transportation rules that define forbidden, class A and class B explosives. These rules have been revised to eliminate the terminology class A and B explosives; they are now identified as division 1.1, 1.2 (formerly Class A) and 1.3 (formerly class B) explosives. Refer to 49 CFR 173.50(b) for more information on forbidden explosives.

Where does this leave a laboratory? EPA guidance says, “Most generators of reactive wastes are aware that their wastes possess this property and require special handling. This is because such wastes are dangerous to the generator’s own operations and are rarely generated from unreactive feed stocks.” Laboratories can assist by helping generators to assess whether their experience handling the waste leads to a conclusion that it meets one of the reactivity properties. Also, for commercial products, laboratories can assist the client in interpretation of Material Safety Data Sheet information relating to reactivity characteristic properties.



LabNotes – Spring 2001
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