

Technical Committee on Classification and Properties of Hazardous Chemical Data

MEMORANDUM

TO: Technical Committee on Classification and Properties of Hazardous Chemical Data

FROM: Denise Beach, Senior Engineer/Staff Liaison

DATE: February 18, 2010

RE: **NFPA 704 ROP Meeting Minutes**

Enclosed are the minutes from the January 12-13, 2010 ROP meeting. Please feel free to bring any substantive incorrect items to my attention.

The next meeting is a Report on Comments (ROC) meeting. Details will be forwarded as they become available.

The Committee actions will be coming shortly in your ballot. If you have any questions or comments, please feel free to contact me at (617) 984-7501 or via email at dbeach@nfpa.org.

MINUTES OF MEETING

Technical Committee on Classification and Properties of Hazardous Chemical Data

January 12 – 13, 2010
Crowne Plaza Chicago O'Hare
Rosemont, IL

I. Attendance:

Principal Members/Staff:

Gary Robinson, Technical Committee Chairman, Liberty Mutual Group, IL
Denise Beach, NFPA, MA
Guy Colonna, NFPA, MA

Robert Michaels, RAM TRAC Corporation, NY
Richard Gowland, European Process Safety Centre, Norfolk, UK
Ron Kirsch, PureSafety, Inc., TN
Arthur Krawetz, Phoenix Chemical Laboratory Inc., IL
Kenneth Lewis, Industrial Fire Protection Section, AL
David Peterson, Madison Fire Department, WI (01/12 only)
James Vigerust, Shaw Group Inc., NM
David Wechsler, The Dow Chemical Company, TX

II. Minutes of Meeting:

- 1. Call to order.** The meeting was called to order at 8:35 a.m. on January 12, 2010. The Technical Committee (TC) members introduced themselves and identified their affiliation.
- 2. Chair's Remarks.** Chairman Gary Robinson welcomed the TC members to the meeting and noted the gratitude of the committee for Amy Cronin's twelve years of support and hard work.
- 3. Staff Liaison Update.** The staff liaison made a brief presentation on the scope, purpose and timeline of the NFPA revision process.
- 4. Agenda Amendments.** The TC amended the agenda to add items for approval of the minutes of the previous meeting, and discussion of the "unresolved items" from those minutes. The TC further amended the agenda to reverse the order of discussion for the consideration of proposals to NFPA 704 and the Global Harmonization System.
- 5. Minutes Approval.** The minutes from the October 2005 ROC meeting were approved as written.

6. NFPA 704 Report on Proposals

- A. **Public Proposals.** The public proposals were reviewed and acted upon. The TC noted that a review of the current edition of the UN Recommendations on the Transport of Dangerous Goods is needed. Committee actions will be presented in the Annual 2011 Report on Proposals (ROP) to be sent to all members and submitters of proposals. Anyone else who would like to receive a free copy can view or download the ROP via our website at www.nfpa.org.
- B. **Committee Proposals.** The Committee created four new Committee Proposals.

7. GHS Discussion. Mr. Colonna reminded the TC of the Notice of Proposed Rulemaking issued by the US OSHA. Mr. Colonna reported that NFPA had submitted written comments, and requested input from the TC to add to verbal testimony that NFPA will present at the March 2, 2010 stakeholders meeting in Washington DC. TC members expressed concern that an OSHA rulemaking may supplant the use of NFPA 704 markings, which are primarily intended to inform first responders. After brief discussion, the TC agreed to provide input to NFPA staff no later than Feb. 26, 2010. [SL Note: NFPA Staff distributed NFPA's written response to TC members on January 15, 2010.]

8. Unresolved Items from Oct. 2005 Minutes.

- A. **Instability Criteria.** The October 2005 minutes reflected the TC's intent to review the instability criteria from the 1990 edition. The TC created a committee proposal (Log #CP8) for the 2012 edition to add the DSC guidance to table 7.2. The TC closed this issue.
- B. **Ethanol Health Rating.** The TC reviewed a memo sent from Mrs. Cronin (nee Spencer) regarding the current health rating of ethanol at 95% and 96% concentrations. The TC noted that the current health rating of "2" for ethanol at these concentrations is supported by material safety data sheets based on its potential for severe but reversible skin or eye irritation. The health rating for ethanol at 95% and 96% concentrations will continue to be listed in the Fire Protection Guide to Hazardous Materials as a "2". The TC closed this issue.
- C. **Flammability Rating and Pyrophorics.** At the October 2005 meeting, a suggestion was made to add the word "pyrophoric" to the flammability rating of 4. The TC reviewed the table, and concluded that the existing language adequately describes pyrophoric material, and therefore no change is needed. The TC closed this issue.
- D. **Water Reactivity Titanium tetrachloride and "+1" issue for assigning W.** In the October 2005 meeting, the TC agreed to review the titanium tetrachloride in the 2001 edition Annex F.4 (removed in the 2006 edition) to see if it is an example of a chemical going from a W2 to a W3 on the basis of formation of gas. The TC reviewed the information as it relates to annex F of the 2007 edition. The TC briefly discussed the issue, but did not see any reason to propose changes to Annex F. The TC closed this issue.

E. Water Reactivity Task Group: Larry Britton, Bill Satterfield and Richard Gowland. The October 2005 minutes included a list of materials for this task group to review in regards to water reactivity questions. The TC held this action item over for the next meeting. NFPA Staff will research MSDS's for the chemicals and post to the e-Committee page. See Attachment B.

F. Materials held for further review. The TC held these action items over for the next meeting. See Attachment C.

9. Other Business. There was no other business to discuss.

10. Review Plans and Schedule. See Attachment A for the document revision timeline.

11. Next Meeting. The next meeting is the Report on Comments (ROC) meeting. The TC tentatively scheduled the meeting for Sept. 29-30, 2010. The TC will be polled to determine the location. Details will be forwarded as they become available.

12. Adjournment. The meeting adjourned at 3:15 p.m. on January 13, 2010.

Attachment A: NFPA 704 ROP Minutes

NFPA 704 Revision Cycle Annual 2011

NFPA 704 A2011 (last cycle A2006) [CLA-AAA]

Intent to enter cycle	July 10, 2009
Proposal Closing	November 29, 2009
ROP Published and Posted	June 25, 2010
Comment Closing	September 3, 2010
Final Date for ROC Meeting	November 5, 2010
ROC Published and Posted	February 25, 2011
Intent to make motion (ITMAM) closing	April 8, 2011
Issuance of standard - NO controversy	May 31, 2011 (publ. bit later)
NFPA WSCE Meeting with NITMAM	June 4-9, 2011
Issuance of Standard – with controversy	July 29, 2011 (published bit later)

Attachment B: NFPA 704 ROP Minutes

Oxidizers. Water reactivity & instability questions

1. There are several chemicals whose MSDS states that "Contact with water or moist air may generate flammable and/or toxic chemicals," yet "extinguishing media" includes "water". Since their instability rating is 1 (rated by MDL), I'm assuming they're NOT water reactive. None listed in Bldg Code HazMat book or FPG as W unless noted otherwise. Oxidizers including:
Sodium peroxide – CAS 1313-60-6 (49, Bldg & 430) – but *Bretherick's Handbook of Reactive Chemicals* (p. 1383 of 4th edn) says contact causes ignition. Britton also thinks should be W. (listed in Bldg as W); review I=1 rating of sodium peroxide if indeed W. [MSDS BC48]
Calcium hypochlorite CAS 7778-54-3 (49, Bldg & 430) – 49 reports "chlorine gas released when wet in "health haz" section; Consider ratings of 3-0-1 and 3-0-0 in BldgCode. Noted in 49 as "thermally unstable" in "Statement of Hazards" section
Potassium Dichloroisocyanurate CAS 2244-21-5 (49, Bldg & 430). Noted in 49 as "reacts with water, releasing chlorine gas" and "thermally unstable" in "Statement of Hazards" section [MSDS BC65]
Nitric Acid, Fuming CAS 7697-37-2 (49, Bldg & 430) Britton reported "Nitric acid doesn't react chemically with water and is moderately exothermic so that boiling isn't expected. However to avoid localized overheating and splattering the concentrated acid should be added to water rather than the other way around, with good mixing. If water is added to concentrated acid care should be taken obviously - but the hazard doesn't rate a W."
Sodium Dichloroisocyanurate CAS 2893-78-9 (49, Bldg & 430). 49 has H=2 and I=2 =1. Bldg has H=1 and I=1; MDL has 2-0-2. [MSDS BC13 and BC69]
2. In 430, SODIUM DICHLORO-S-TRIAZINETRIONE Dihydrate is listed as a Class 1 oxidizer, whereas SODIUM DICHLORO-S-TRIAZINETRIONE is listed as a Class 3. Are they pretty similar in other aspects? I rated the dehydrate as 1-0-1 OX and the other as 1-0-2 OX and not water reactive.

Nitrogen Tetraoxide 10544-72-6 classified as "oxidizing gas" also have a class – why?

It's Not in defn of OxG

78-88-6 ; 57-57-8 betaPropiolactone – Htox but no NFPA 704 rating

85-44-9 Phthalic anhydride; 3457-61-2 -- Htox but H=2

Attachment C: NFPA 704 ROP Minutes

Materials held for further review. The following items need committee review.

A. Chemical Changes

a. Formaldehyde. Formaldehyde (100%) is not commercially available in pure form, such as a compressed gas, owing to polymerization, therefore it will be removed from the FPG. See PCDCA conclusions (attachment C.3, #8): change NFPA 325's AIT (ignition temp) to 430C. For the proposed AIT modification, the PCDCA conclusions were based on three respected sources: International Chemical Safety Card (ICSC) that is peer-reviewed, EPA's Air Toxic Information and Sax 6th edition. The existing flammability limits were confirmed and should be maintained. <Research by Mickey Norsworthy>

b. o-Methoxybenzaldehyde. See Attachment C.1.

c. Di-tert-butyl peroxide. CAS 110-05-4 – proposal to 432. They rate it 1-3-2 (432 page 14), but never put in the OX; 13th edn of FPG (p.39) listed it as 3-2-4OX; Amy rated - different in Bldg Code book (p. 74) as 1-3-4OX and increased F=3 based on flashpoint. Amy also questioned H=3 - no data to support and looks like a 1 in 432 and MDL therefore changed. Rated in 4/98 and just kept same data since it was a peroxide theoretically to be removed. Also see Attachment C.2, #2 also covering this chemical question.

d. Mustard Oil Could CAS # also be 8007-40-7? Listed as 57-06-7

B. Chemical Changes - Items held from previous meetings. (Amy possibly remove "aerosols from PrevMtgRatingQuestions.pdf on committee website")

a. Peroxides in NFPA 432 (12-00 ROC agenda, now found in "PrevMtgRatingQuestions.pdf" file on committee website).

b. Flammability rating of chloroprene (12-00 ROC agenda, now found in "PrevMtgRatingQuestions.pdf" file on committee website).

c. Flammability and instability ratings of gallium phosphide (noted in 12-00 ROC minutes without background about why question was raised).

C. Chemicals highlighted during creation of book, *Building and Fire Code Classification of Hazardous Materials*.

See Attachment C.2. These were chemicals rated by Amy that I would like committee to review. Either "new" chemicals or committee ratings I had serious questions about. Amy will likely need to pull the MSDSs and create another .pdf file of the scanned MSDSs for committee review.

D. Changes proposed by the PCDCA. The Physical and Chemical Data Consistency Advisory Committee (PCDCA) made some suggested changes based on inconsistent data throughout the NFPA codes and standards. See Attachment C.3 for suggested changes to 49 and 325.

Attachment C.1: – *o*-Methoxybenzaldehyde

**RE: Inquiries about *o*-methoxybenzaldehyde
synonym: *o*-anisaldehyde; CAS 135-02-4**

1. **No original source for disputed 104°F oc (40°C) flashpoint reported in NFPA 325.** NFPA 325 quotes the flashpoint as 104°F oc (40°C); when I go back to the archives, the flashpoint is listed as 244°F (oc) with the source listed as “Ansul Chemical Company, Marinette, Wisconsin (Laboratory Results)”.
2. **What is correct flashpoint?**
 - a. Our archives quote 244°F (oc) from the Ansul Chemical Company lab results;
 - b. MDL quotes 243°F (117°C) using SCC method; I’m assuming this is the Setaflash Closed Tester, which states in NFPA 704 that this method is to be used for aviation fuels or for “liquids having flash points in the range of 32°F (0°C) to 230°F (110°C)”. This chemical doesn’t seem to fall in this range.
 - c. The questioner quoted Aldrich, Sax and Acros with the flashpoint as 243°F (117°C).
3. **If NFPA 325 uses 104°F as the flashpoint, why is the flammability rating 1?** It appears it would be a 2 from the flashpoint data of 104°F; it appears to have a rating of 1 if the higher flashpoint is used.
4. **Boiling Point of 275°F (135°C) questioned.**
 - a. MDL quotes a boiling point of 457-471°F (236-244°C)
 - b. Questioner quoted CRC Physical Properties of Organic Chemicals as 470°F (243.5°C).
5. **CONCLUSION: Is there any reason not to change the flashpoint to 243°F (117°C) with a flammability rating of 1? Is there any reason not to change the boiling point to the MDL quoted range of 457°F (236-244°C)?**

Attachment C.2: Products in Building Code database that "Amy rated" to be checked by 704 TC from October 2005 minutes

1. **Sodium Dichromate CAS 10588-01-9.** Not currently in 325 or 49; Amy rated 3-0-0 OX; originally from NFPA 430, Annex B.2.
2. **Di-tert-butyl peroxide 110-05-4** – no just for 3-2-4 OX; Amy changed to 1-3-4OX
3. **4-(2-Aminoethyl)-Morpholine 2038-03-1** Appears to be corrosive - consider changing Health Rating to "3" from "2". 2 flammability means II or IIIA but MDL has FP =345F(scc)
4. **Diglycol Chlorohydrin 628-89-7**
5. **Beta-Propiolactone 57-57-8** – health rating Yikes - 13edn 325 rates 0-2-0; Rated 4/1/97 3-1-0 and another 0-2-0. Problem!! Appears highly toxic by inhalation and corrosive - problem!!
6. **Tri-n-Butyl Borate 688-74-4** Check health rating - MDL says corrosive 1 place but nowhere else; Amy changed F=2 to F=1 due to FP = 200F; should it be 5000 toxic or highly toxic?
7. **Sodium Peroxide 1313-60-6** MSDS states "may explode on contact with water," yet "extinguishing media=water". 704 rating from MDL, yet I=1 insinuates not water reactive; Bretherick's Handbook of Reactive Chemicals (p. 1383 of 4th edn) says contact causes ignition. Larry Britton, TC member agrees. MSDS BC48
8. **tert-Butyl Hydroperoxide 75-91-2** Note: May explode. See NFPA 49 contained in this Guide. How was 4 flamm rating determined and what is OSHA class? NFPA 432 rates it as a 3-2-2.
9. CAS # needed for tert-butylstyrene in bldg code guide
10. **Linalool, Synthetic, MSDS indicated OX possibility 78-70-6**
11. **Methyl Formate 107-31-3** – is it toxic or highly toxic? Listed as INS for now.
12. **Vinyl Ethyl Ether 109-92-2** – is it toxic or highly toxic? Listed as INS for now.
13. **Vinyl Toluene 25013-15-4**– is it toxic or highly toxic? Listed as INS for now.
14. **19624-22-7** Note: Ignites spontaneously in air. See NFPA 49 contained in this Guide. Data suggests IC but F=4 is not IC; left OSHA class blank
15. **Triisobutylaluminum 100-99-2** Note: May ignite spontaneously in air. Appears to be Class 1B - is it? left OSHA class blank
16. **Triethylaluminum 97-93-8** Note: Ignites spontaneously in air. Looks like at least toxic so re-examine. Is it a IB from data? Left at INS and blank respectively for now.
17. **Diisobutylaluminum Hydride 1191-15-7** FIRE: 4. May ignite spontaneously on exposure to air. Why did Meghan call it a IB? Left blank for now.
18. **Petroleum Crude Oil 8002-05-9** Note: I rating based on MDL; why would MDL call a F=4 a IB?
19. **Petroleum Ether 64475-85-0** Looks like we also did in 4-98 with -2-0(????) FIRE: No fl pt on MSDS. Retained present rating in absence of data in support of a change. USCGs CHRIS: F1 pt= 105-1400F, oc. 8-03: "Benzine" entry was deleted; duplicate Why would MDL call it a IB?
20. **Chromic Acid 1333-82-0** is it toxic or highly toxic? Listed as INS for now.
21. **Cumene 98-82-8** is it toxic or highly toxic? Listed as INS for now.
22. **Methyl Formate 107-31-3** is it toxic or highly toxic? Listed as INS for now.
23. **Methyltrichlorosilane 75-79-6** is it toxic or highly toxic? Listed as INS for now.
24. **p-Nitrotoluene 99-99-0** is it toxic or highly toxic? Listed as INS for now.
25. **Vinyl Ethyl Ether 109-92-2** is it toxic or highly toxic? Listed as INS for now.
26. **Sulfuric Acid.** Any reason for Sulfuric acid to change from being 3-0-2 W as in NFPA 49? Why toxic = no in the Building & Fire Code Classification of Hazardous Materials?

Attachment C.3: PCDCA proposed changes

Proposed changes from PCDCA

1. Acetic Acid (64-19-7). Change AIT to 426C from 516C in NFPA 49 and from 463 in NFPA 325. For acetic acid, the PCDCA conclusions were based on upon review of twenty (20) sources, including fourteen (14) safety data sheets. For the autoignition temperature, the exact same values for these proposed changes were observed in the following sources: Hazardous Substances Databank, and MSDSs from Genium and Fisher.
2. Acetic Anhydride (108-24-7). Change FP to 49C from 52C in NFPA 49. Change AIT to 316C from 630F (332C) in NFPA 49. Change LFL to 2.7% from 2.9% in NFPA 49. For acetic anhydride, the PCDCA conclusions were based on upon review of twenty (20) sources, including fourteen (14) safety data sheets. For the flash point, the exact same values for these proposed changes were observed in the following sources: NFPA 325, Hazardous Substances Databank, NIOSH Pocket Guide, and Malinkrodt/Baker MSDS. For the proposed changes for flammability limits and autoignition temperature; the exact same values were observed in the following sources: NFPA 325, ChemInfo, Hazardous Substances Databank, and Malinkrodt/Baker MSDS.
3. Ethylene Oxide (75-21-8). Change FP to -20C from -20F in NFPA 325. The ---- -20F data were also in New Jersey HSFS, NIOSH Pocket Guide who likely copied it incorrectly from us (notify Mike Barsan of NIOSH if we change). For ethylene oxide, the PCDCA conclusions were based on upon review of eight sources. The existing flashpoint was confirmed and should be maintained; the exact same value was observed from ChemInfo and NFPA 49. Other data source for closed cup flashpoint such as Chemical Search and Retrieval System, CHRIS, and Hazardous Substances Data Bank reported the value at "<0°F".
<Note to TC – Krawetz’s research with PCDCA>
4. Acrylonitrile (107-13-1). Says “water soluble in 325 and in 49 says “not soluble”—reconcile. Change NFPA 49 UFL to 3 and UFL to 17.and make notation that FP of 0C is (oc).
5. Ethyl Nitrate. In this particular case, it was noted that there were data inconsistencies between NFPA 86 and NFPA 325. Upon further research, the PCDCA was unable to locate a manufacturer of this material. Of the reputable Internet MSDS databases, the PCDCA was unable to locate ethyl nitrate. The committee theorized that the material is made only in small lots. In the event that there is some unique reason for NFPA 86 to keep the material, it is suggested that the LFL value be made consistent with NFPA 325, either by changing NFPA 86 or proposing change to NFPA 325.
6. Benzene. Change NFPA 49 LFL to 7.8 to be consistent with NFPA 325 and the findings of the PCDCA (Gowland did this chemical).
7. Ethyl Benzene (100-41-4). Change NFPA 49 and 325 FP to 15 C (cc). Change NFPA 49’s flammability limits to 0.8 and 6.7 to be consistent with PCDCA and NFPA 325. For ethyl benzene, the PCDCA conclusions were based on upon review of eleven sources. Three sources has the flash point of 21C (325, 49 and 497), three had 15C (NFPA 86, Physical and Theoretical Chemistry Lab Safety,

and CP Chemicals MSDS) and three had 18C (OSHA web page, International Chemical Safety Card and the Merck Index). The most conservative number from equally reputable sources was chosen as the "official NFPA value". <Research done by Mickey Norsworthy>

8. Formaldehyde. Change NFPA 325's AIT (ignition temp) to 430C. For the proposed AIT modification, the PCDCA conclusions were based on three respected sources: International Chemical Safety Card (ICSC) that is peer-reviewed, EPA's Air Toxic Information and Sax 6th edition. The existing flammability limits were confirmed and should be maintained. <Research by Mickey Norsworthy>
9. Ethyl Ether or Diethyl Ether (60-29-7). Change AIT to 160C, ensure FP is -45C cc, Flamm lims are 1.9 and 36.