

IEEE P2520.1 Working Group #19

Meeting Minutes

28 November 2022

WG Chair: James Covington

WG Secretary: H. Troy Nagle

Meeting link:

<https://ieeesa.webex.com/ieeesa/j.php?MTID=m82e91b46d0bd2bee1c7ff60ec42c8cce>

1. Call to Order

Chair called meeting to order at 10:06 AM EDT. He announced that the meeting was being recorded for the purpose of preparing minutes.

2. Roll Call and Disclosure of Affiliation

Affiliation FAQs: <http://standards.ieee.org/faqs/affiliation.html>

The Chair announced that participants can sign-in at this link:

https://docs.google.com/spreadsheets/d/1x3Le7jd_5h3bgiNcYMZIfjIbzE2XdE0U8Daon00O8Ks/edit#gid=0.

The Chair asked the Secretary to check for a quorum. No new members were participating. The List of Participants is shown in **Attachment A**. A quorum was achieved (13 of the 19 voting members were present).

3. Approval of Agenda

The Chair asked for approval of the agenda. Susan Schiffman made the motion; Fengchun Tian seconded. Without objection to unanimous consent, the motion was adopted.

4. Approval of Previous Meeting Minutes

The Chair asked for approval of the October 31 Meeting Minutes as circulated. One typographical error was corrected. Krishna Persaud made the motion to approve as corrected; Christopher Jensen seconded. Without objection to unanimous consent, the motion was adopted.

5. IEEE-SA Patent & Copyright Policies

a. Call for Patents

<https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf>

Per standard IEEE SA WG meeting practice, the Chair displayed the required policy regarding potentially essential patents. No one raised concerns for consideration.

b. Copyright Policy <https://standards.ieee.org/ipr/copyright-materials.html>

Per standard IEEE-SA WG meeting practice, the Chair displayed the required policy regarding copyrights. There were no questions or concerns.

6. Technical Presentation:

There was no technical presentation. Instead, the major focus for this meeting was:

- Updates and discussion of chemicals list
- Review the chemical group lists
- Review the current standard version

7. Discussion of Chemical Options

[Our Goals for Appendix A:](#)

APPENDIX A: CHEMICAL LIST

- Five groups – with potentially 2 to be from available from standard cylinders.
- Must be available to 200% of defined concentration
- Potential criteria...
 1. Any cylinder should use air as the make up
 2. All the ODTs should be of a similar magnitude
 3. Concentrations should be x10 to x1000 of ODT
 4. Concentrations should be similar – though not identical
 5. Chemical choices should make some sense – though does not need to be application specific

[Review of the five Chemical Groups:](#)

[Group 1 and Group 2:](#) The WG reviewed the current Group 1 and Group 2 chemical lists. It was decided that the following would be adopted pending a perceived intensity check by human subjects.

GROUP 1

Group 1 – GAS Bottle	Chemical	CAS	ODT (ppm/v)	Conc. ppm	LD50 mg/kg Rat Oral
Chemical A	Acetone (C3H6O)	67-64-1	42	50	3000
Chemical B	Isopropanol (C3H8O)	67-63-0	26	50	5000
Chemical C	Isobutylene (C4H8)	115-11-7	10	50	34600

Group 1 – GAS Bottle & liquid	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Supplier	Bottle Conc.
Chemical A	1000	250	Calgas	100 ppm in air
Chemical B	400	400	Calgas	100/500 ppm in air
Chemical C	N/A	N/A	Linde	100/1000 ppm in air

Group 2: First we reviewed the list of chemical alternatives for Group 2 for a replacement for toluene.

GROUP 2: CHEMICAL ALTERNATIVES

Group 1 – GAS Bottle	CAS	ODT (ppm/v)	LD50	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Bottle Conc. (ppm)
Ammonia (NH3)	7664-41-7	1.5	350	50	25	10/100 ppm in air
Benzene (C6H6)	71-43-2	2.7	930	1	0.1	0.5/1/1.4 ppm in air
Butadiene (C4H6)	106-99-0	0.23	5480	1	<1	5 ppm in air
Ethylene (C2H4)	74-85-1		4700	N/A	N/A	100/1000 ppm in air
Ethane (C2H6)	74-84-0		648	N/A	N/A	100/1000 ppm in air
Methanol (C4HO)	67-56-1	33	1187	200	200	100-400 ppm in air
Propylene (C3H6)	115-07-1	12	20000	N/A	N/A	50/100/200 ppm in air

After discussion, the following list was adopted. For safety reasons, the concentration of toluene may be decreased in the future.

GROUP 2

Group 1 – GAS Bottle	Chemical	CAS	ODT (ppm/v)	Conc. ppm	LD50 mg/kg Rat Oral
Chemical A	N-Hexane (C6H14)	7664-41-7	1.2	10	25000
Chemical B	Ethanol (C2H6O)	64-17-5	0.52	10	10470
Chemical C	Toluene (C7H8)	108-88-3	0.33	10	636

Group 1 – GAS Bottle & liquid	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Supplier	Bottle Conc.
Chemical A	500	50	Linde	100/500 ppm in air
Chemical B	1000	1000	BOC	100 to 500 ppm in air
Chemical C	200	200	Linde	100/200 ppm in air

Group 3: This chemical list was discussed.

GROUP 3

Group 1 – GAS Bottle	Chemical	CAS	ODT (ppm/v)	Conc. ppm	LD50 mg/kg Rat Oral
Chemical A	n-butanol (C4H10O)	71-36-3	0.038	0.2	300-2000
Chemical B	Propanoic Acid (C3H6O2)	79-09-4	0.0057	0.06	2600
Chemical C	Dimethyl Sulfide (C2H6S)	75-18-3	0.0030	0.06	106

Group 1 – GAS Bottle & liquid	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Supplier	Bottle Conc.
Chemical A	100	N/A		
Chemical B	N/A	10		
Chemical C	N/A	N/A		

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These chemicals are used in other standards and their recovery rates have been documented in archival journal papers by Pernille Kasper, Department of Engineering, Aarhus University, Denmark. The concentrations might be increased by a factor of 10 at a future date. These will be our target values. We can adjust next year during our testing phase.

Group 4: After discussion, the following concentration levels were adopted.

GROUP 4

Group 1 – GAS Bottle	Chemical	CAS	ODT (ppm/v)	Conc. ppm	LD50 mg/kg Rat Oral
Chemical A	n-butanol (C4H10O)	71-36-3	0.038	20	300-2000
Chemical B	Nonane (C9H20)	111-84-2	2.2	100	Not listed
Chemical C	Propyl acetate (C5H10O2)	109-60-4	0.24	24	9370

Group 1 – GAS Bottle & liquid	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Supplier	Bottle Conc.
Chemical A	100	N/A		
Chemical B	500	50		
Chemical C	200	200		


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Group 5: After discussion, the following concentrations were adopted.

GROUP 5

Group 1 – GAS Bottle	Chemical	CAS	ODT (ppm/v)	Conc. ppm	LD50 mg/kg Rat Oral
Chemical A	Isoamyl acetate (C7H14O2)	123-92-2	2	6	16600
Chemical B	Isoamyl alcohol (C5H12O)	123-51-3	250-300	100	200
Chemical C	Phenylethyl alcohol (C8H10O)	60-12-8	750-1100	500	1610

Group 1 – GAS Bottle & liquid	OSHA PEL TWA (ppm)	NIOSH REL (ppm)	Supplier	Bottle Conc.
Chemical A	100	100		
Chemical B	100	100		
Chemical C	N/A	N/A		

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Everyone agrees that this is a good starting point. The next phase will be testing and will be challenging. We envision test setups for gas cylinders, aerosols/liquids, and permeation tubes. Humidity generation and control will be critical. Validation of the generated sample must be reported. Permeation tubes are highly traceable making validation straightforward. The Chair will insert these chemical group tables into the standard draft and upload to iMeet Central for review by the Working prior to our next meeting.

8. New Business/Activities for the Next Meeting

There was no New Business.

9. Future Meetings

The Chair announced the next meeting (WG#20) will take place on January 30 at 10:00 AM EST.

10. Adjourn

The one-hour meeting time-period having expired and without objection to unanimous consent, the Chair adjourned the meeting at 11:07 AM.

Attachment A: Participants (13)

NAME	AFFILIATION
Carlos Diaz	Ambiente et Odora
Christopher Jensen	Self
Etienne Bultel	Aryballe
Ettore Massera	ENEA
Fengchun Tian	Chongqing University
James Covington	University of Warwick
Katayoun Emadzadeh	Self
Krishna Persaud	University of Manchester
Paul Kagan	AWLDM Systems
Sandrine Isz	Alpha-MOS
Saverio De Vito	ENEA
Susan Schiffman	North Carolina State University
Troy Nagle	North Carolina State University