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Sub-Committee of Experts on the Transport of Dangerous Goods

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Geneva, 28 November-6 December 2016
Item 7 (b) of the provisional agenda
Issues relating to the Globally Harmonized System of Classification and Labelling of Chemicals: tests and criteria for oxidizing liquids and solids

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals

Thirty-second session

Geneva, 7-9 December 2016
Item 2 (b) of the provisional agenda
Classification criteria and related hazard communication: work of the TDG Sub-Committee on matters of interest to the GHS Sub-Committee

Test and criteria for oxidizing liquids (Test O.2) and oxidizing solids (Test O.3) - Final results from the Round Robin Testing Programme and proposals for amendments to tests descriptions

Transmitted by the expert from France[1]

Introduction

1. During its seventh session the Committee approved the programme of work of its two sub-committees for the biennium 2015-2016 (see ST/SG/AC.10/42, para 15; ST/SG/AC.10/C.3/92, para 95; ST/SG/AC.10/C.4/56, annex III). This programme of work includes the tests and criteria for oxidizing liquids and solids.

2. The calendar for the Round Robin Testing (RRT) Programme in Tests O.2 and O.3 indicated by the expert from France in ST/SG/AC.10/C.3/2014/95 - ST/SG/AC.10/C.4/2014/19 has been applied.

[1] In accordance with the programme of work of the Sub-Committee for 2015-2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.3/92, paragraph 95 and ST/SG/AC.10/42, para. 15)

3. From this RRT Programme, two steps were identified:

Step 1: "Test O.2 test for oxidizing liquids" and

Step 2: "Test O.3 test for oxidizing solids".

Two reports of progress were issued and presented accordingly, see ST/SG/AC.10/C.3/2015/6 and informel document INF.39 (TDG Sub-Committee forty-seventh session) for step 1 and ST/SG/AC.10/C.3/2015/49 - ST/SG/AC.10/C.4/2015/12 for steps 1 and 2 (TDG Sub-Committee forty-eight session and GHS Sub-Committee thirtieth session).

4. The provisional results from the RRT Programme were given in ST/SG/AC.10/C.3/2016/12 - ST/SG/AC.10/C.4/2016/3 as well as first proposals for amendments to test descriptions regarding the replacement cellulose.

5. Due to late results from participating laboratories, the final report from the RRT Programme Step 2was issued only in June 2016. It was distributed to participants and in addition appended to informal document INF.47 (TDG Sub-Committee forty-ninth session) for supplementing ST/SG/AC.10/C.3/2016 - 12-ST/SG/AC.10/C.4/2016/3.

Results from the Programme

6. Step 1 was launched in February 2015 and ended in August 2015. Nine laboratories from five countries participated.

- In a preliminary phase INERIS, France as leading laboratory for the RRT selected three cellulose candidates i.e. ARBOCEL B00, TECHNOCEL 150 and SIGMA C6288 as replacement substance of cellulose WHATMAN CF11.
- The overall results indicated that the celluloses ARBOCEL B00 and TECHNOCEL 150 were the best candidates and were judged to give results of equivalent quality compared to the ones with cellulose WHATMAN CF11.

7. It should be emphasized that with these new cellulose candidates some variations could be observed for allocating either packing group II or packing group III due to difficulties for differentiation between both packing groups.

8. In accordance with the anticipated approach for trying to select the same cellulose candidate(s) for Test O.2 and Test O.3 as cellulose WHATMAN CF11 was the unique cellulose used in both tests, see ST/SG/AC.10/C.3/2014/95 - ST/SG/AC.10/C.4/2014/19, table in para 1), Step 2 was launched in September 2015. Nine laboratories from six countries participated.

Step 2 focused on the two cellulose candidates i.e. ARBOCEL B00 and TECHNOCEL 150 selected in Step 1.

9. From the first results obtained by various participating laboratories, it appeared that celluloses ARBOCEL B00 and TECHNOCEL 150 were not giving the best results in comparison with a third cellulose. TECHNOCEL 75, which was tested some time ago in Test O.3 when designing this test. For this reason, a meeting was organized on 15 January 2016 for examining with laboratories participating in RRT Step 2 and other interested bodies which additional testing was needed. It was then decided to extend the Step 2 programme for testing additionally cellulose TECHNOCEL 75.

10. This extension of Step 2 was immediately launched at the end of January – beginning of February 2016. Ten laboratories from seven countries were participating.

11. Among the specifications for the cellulose candidates for replacement, it was suggested that the particle size and apparent density should be retained as well as pH-value, taking also into account the availability in various parts of the world.

12. Based on the comments already received on final report from RRT Programme, as suggested by the subcommittees in their reports from 49th and 31st sessions respectively see ST/SG/AC.10/C.3/98 para 128 and ST/SG/AC.10/C.4/62 Annex II paras 2 and 3, the expert from France is proposing the following taking into account that the proposed replacement celluloses are available worldwide.

13. For Test O.1 (Test for oxidizing solids) which was not part of RRT Programme but is similar in principle to Test O.3, the same amendments as the ones proposed to Test O.3 should be retained.

Proposal for amendments to Test O.2 and Test O.3 descriptions

Proposal 1

14. Replace in the Test O.2 description, i.e. in section 34.4.2.2.5 of the Manual of Tests and Criteria, ST/SG/AC.10/11/Rev.6, the following sentence and the footnote 3.

> "Dried, fibrous cellulose with a fibre length between 50 and 250 µm and a mean diameter of 25 µm, is used as the combustible material."
>
> by the following sentence and footnote 3:
>
> "Dried white cellulose [3], with a fibre mean diameter of ca. 25 µm, grain size ca. 100 µm, apparent density 150 to 200 kg/m^3 and pH-value between 5 and 7.5, is used as the combustible material."
>
> "[3] Source reference available from the national contact for test details in France (see Appendix 4)".

Proposal 2

15. Replace in the Test O.3 description, i.e. in section 34.4.3.2.2 of the Manual of Tests and Criteria, ST/SG/AC.10/11/Rev.6, the following sentence:

> "Dried fibrous cellulose with a fibre length between 50 and 250 µm and a mean diameter of 25 µm, is used as the combustible material."
>
> by the following sentence with a new footnote 5:
>
> "Dried white cellulose [5], with a fibre mean diameter of ca. 25 µm, grain size less than 100 µm, apparent density 170 kg/m^3 and pH-value between 5 and 7, is used as the combustible material."
>
> "[5] Source reference available from the national contact for test details in France (see Appendix 4)".
>
> Renumber footnote 5 in 34.4.3.3 as footnote 6.

Proposal 3

16. Replace in the Test O.1 description, i.e. in section 34.4.1.2.2 of the Manual of Tests and Criteria, ST/SG/AC.10/11/Rev.6, the sentence:

> "Dried fibrous cellulose (1), with a fibre length between 50 and 250 µm and a mean diameter of 25 µm, is used as the combustible material."
>
> by the following sentence:
>
> "Dried white cellulose (1), with a fibre mean diameter of ca. 25 µm, grain size less than 100 µm, apparent density 170 kg/m^3 and pH-value between 5 and 7, is used as the combustible material."

Proposal 4

17. Replace in Test O.2, Test O.3 and Test O.1 descriptions, i.e. in sections 34.4.2.1, 34.4.3.1 and 34.4.1.1 of the Manual of Tests and Criteria, ST/SG/AC.10/11/Rev.6, "fibrous cellulose" by "cellulose".

Proposal 5

18. In addition to the above proposals, the results from the RRT Programme indicate that some improvement in test materials and procedures should be needed as consequences of the replacement of cellulose, e.g.

- for references substances as regards allocation to PGII and PGIII in Test O.2; and
- reference oxidizer, coefficient of correlation (R^2) and standard deviation for burning rates in Test O.3.

19. If such consequential changes to the test materials and procedures are considered as necessary, the expert from France proposes to include the corresponding work in the programme of work of the Sub-Committees for 2017-2018. If so the expert from France is suggesting to lead the work as a follow-up of the RRT Programme.