National Institute of Standards & Technology

Certificate

Standard Reference Material 1049

University of Pittsburgh I Smoke Toxicity Method Standard
(30-Minute Exposure plus 10-Minute Post-Exposure Period)

This Standard Reference Material (SRM) is intended primarily for checking the operation of the University of Pittsburgh I Smoke Toxicity Method. SRM 1049 consists of 150 g of nylon 6/6 which has the molecular structure $[-NH(CH_2)_6NHCO(CH_2)_4CO-]_n$. The quantity of nylon 6/6 included in each SRM unit should be sufficient to calibrate the University of Pittsburgh I Smoke Toxicity Method four times; i.e., with this number of grams, one should be able to determine the LC_{50} value four times.

For purposes of calibrating the University of Pittsburgh I Smoke Toxicity Method, the certified figure of merit is the LC_{50} value plus its 95% prediction interval which was determined to be:

$$4.4 \pm 3.4 \text{ g}$$

The 95% prediction interval indicates the range in which the next determined LC_{50} value would be expected to fall. If an investigator tests this SRM under laboratory conditions according to the specifications of the University of Pittsburgh test procedure and finds the LC_{50} value is within the certified 95% prediction interval, the probability is good that the test is being conducted correctly.

This LC_{50} value and the 95% prediction interval are based on both interlaboratory and intralaboratory evaluations of the material. A total of eleven series of tests were conducted at 5 laboratories; each series was statistically analyzed to generate a LC_{50} and a 95% confidence interval. The uncertainty of each fit and the differences between series were incorporated into the final certified LC_{50} and 95% prediction interval. The details of the procedure are presented in references [1] and [2]. The research conducted to develop this SRM is described in reference [3].

The research evaluation leading to the certification of this SRM was conducted at NIST by B.C. Levin of the Fire Measurement and Research Division and S.B. Schiller of the Statistical Engineering Division. The interlaboratory and intralaboratory evaluations were conducted by Anderson Laboratories, Southwest Research Institute, University of Pittsburgh, U.S. Testing Company, Inc. and Weyerhaeuser Company.

The technical and support aspects concerning the preparation, certification, and issuance of this SRM were coordinated by the Standard Reference Materials Program by N.M. Trahey.

REFERENCES

[1] Alarie, Y. and Anderson, R.C., Toxicologic and Acute Lethal Hazard Evaluation of Thermal Decomposition Products of Synthetic and Natural Polymers. Tox. & Appl. Pharm. 51: 341-362 (1979).

[2] Alarie, Y. and Anderson, R.C., Toxicologic Classification of Thermal Decomposition Products of Synthetic and Natural Polymers. Tox. & Appl. Pharm. 57: 181-188 (1981).

[3] Levin, B.C., Alarie, Y., Stock, M.F., and Schiller, S.B., The Development of a Standard Reference Material for Calibration of the University of Pittsburgh Smoke Toxicity Method for Assessing the Acute Inhalation Toxicity of Combustion Products. NIST Journal of Research 97: 245-252 (1992).

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