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"Gheorghe Asachi" Technical University of Iasi, Romania

FACTORS AFFECTING THE REPRODUCIBILITY OF WASTE SAMPLING AND COMPOSITION ANALYSES

Emilia den Boer[1*], Andrzej Jędrczak[2], Jan den Boer[3], Tadeusz Butrymowicz[2]

[1]*Wrocław University of Science and Technology, Faculty of Environmental Engineering, Section of Waste Technology and Land Remediation, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław Poland*
[2]*University of Zielona Góra, Institute of Environmental Engineering, ul. Szafrana 15, 65-516 Zielona Góra, Poland*
[3]*Wrocław University of Environmental and Life Sciences, Institute of Agricultural Engineering, Division of Low Emission Energy Sources and Waste Management, ul. Chełmońskiego 37a, 51-630 Wrocław, Poland*

Abstract

This paper summarises the main findings regarding the precision of municipal residual waste sampling and composition analyses attended by six laboratories. The purpose of the performed analyses was to determine factors affecting reproducibility of the procedure, which is supposed to become part of the new Polish waste analysis standard, in comparison to the previous standard. A sample size of 100 kg is proposed as a required sample size in the new norm, while 5 kg samples were used in the previous norm. The sorting samples were derived from a batch of waste delivered by collection vehicles. In case of the 100 kg sample, the average coefficient of variation for the 11 main material fractions amounted to 44%, while for the 5 kg sample it was 72%. In case of 100 kg samples, 10 repetitions would provide statistically valid contents of the major material fractions, even if sorting is done be different teams. Sorting into 36 material sub-fractions provided very high variability of results between the labs. The proposed methodology provides a good basis for a waste sampling standard, however, due to the high rate of human involvement there is still some room for subjectivity. Among factors affecting the reproducibility of results the most important are: the sorting mechanism (including the shape of slots and the effectiveness of sieving) and interpretation of the individual material categories. A more accurate definition of those could improve the reproducibility of the procedure.

Key words: reproducibility, residual waste, sampling, sorting

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[*]Author to whom all correspondence should be addressed: e-mail: emilia.denboer@pwr.edu.pl; Phone: +48 790757706; Fax: +48 71 328 29 80