

Evaluation of Emission of Volatile Organic Compounds (VOCs) from Interior Parts and Materials for Automobiles

Overview

The method of measuring emissions of volatile organic compounds (VOCs) emitted interior parts and materials in automobiles was specified in an automotive specification as JASO M 902 by the Society of Automotive Engineers of Japan, Inc., on March 22, 2007. The specification regulates the use of a sampling bag to measure VOCs, formaldehyde and other carbonyl compounds emitted into the air from the interior parts and materials of automobiles.

Sampling method and examples of measurements

Figure 1 outlines the sampling method. The sample for testing is sealed inside a 10l capacity sampling bag which is then charged with 5l of nitrogen gas and is heated at 65°C for 2 hours in a constant-temperature oven. The gases emitted into the bag are collected in a Tenax tube (VOCs) and DNPH cartridge (aldehydes). The VOCs collected in the Tenax tube and DNPH cartridge are then measured by thermal desorption GC/MS and HPLC. Figure 2 shows a VOC measurement chromatogram by GC/MS as an example.

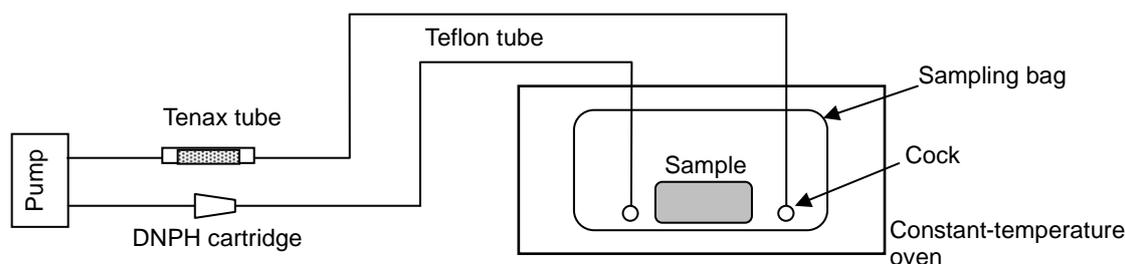


Fig. 1 Outline of method of sampling.

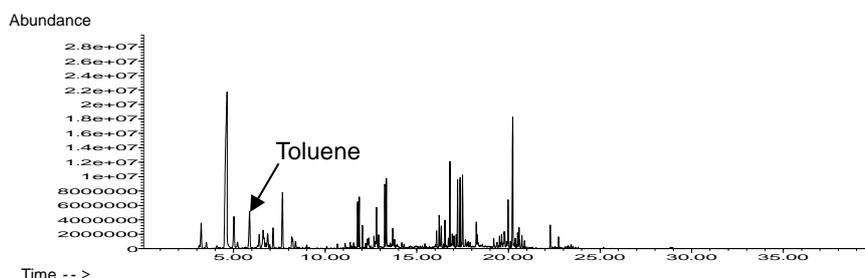


Fig. 2 TIC chromatogram for VOCs.

Recovery tests

Known amounts of formaldehyde and toluene are added to the sampling bag and recovery tests are performed. The results are shown in Table 1. Good results were achieved, with a mean recovery rate of at least 80% in the recovery tests.

Table 1 Results of recovery tests

Test item/Sample No.	No.1	No.2	No.3	No.4	No.5	Mean
Formaldehyde	91	93	90	93	91	92
Toluene	83	77	94	96	92	88

We also have established measurement methods corresponding to the specification tests set by the individual automakers.

Created by SCAS: <http://www.scas.co.jp/analysis/pdf/tn342.pdf>

Total solution partner for analyses, measurements, and evaluations.

SCASS
SCAS SINGAPORE PTE LTD

[Laboratory] 17 Sakra Road, Pulau Sakra, Singapore 627886
[Office] 2 Jurong East Street 21, #04-02 IMM Building, Singapore 609601
E-mail: scass@scass.com.sg WEB site: <http://www.scass.com.sg/>