

**Supplementary material**

**Simultaneous screening of major flame-retardants and plasticizers in polymer materials using pyrolyzer/thermal desorption gas chromatography mass spectrometry (Py/TD–GC–MS)**

**Hiroyuki Yanagisawa,<sup>1</sup> Yukihiro Kudo,<sup>2</sup> Katsuhiro Nakagawa,<sup>2</sup> Haruhiko Miyagawa,<sup>2</sup> Fumitaka Maruyama,<sup>1</sup> and Shigehiko Fujimaki<sup>1, \*</sup>**

<sup>1</sup> Consumer & Retail Service Division, SGS Japan Inc. YBP East Tower 12F, 134 Godo-cho, Hodogaya-ku, Yokohama 240-0005, Japan

<sup>2</sup> Analytical & Measuring Instrument Division, Shimadzu Corporation, 1 Nishinokyo Kuwabara-cho, Nakagyo-ku, Kyoto 640-8511, Japan

\* Correspondence: shigehiko.fujimaki@sgs.com; Tel.: +81-45-330-1101

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Supplementary material Table S1. Summary of experimental parameters; sensitivity, correlation coefficient ( $R^2$ ) and relative standard deviation (RSD) at 1,000 mg/kg SCCPs solution.

| Fragment ion ( $m/z$ ) | Sensitivity (Area/(mg/kg)) | $R^2$ | RSD (%) |
|------------------------|----------------------------|-------|---------|
| 75                     | $7.7 \times 10^2$          | 0.998 | 5.2     |
| 89                     | $8.8 \times 10^2$          | 0.998 | 5.0     |
| 91                     | $6.1 \times 10^2$          | 0.999 | 4.8     |
| 105                    | $4.2 \times 10^2$          | 0.999 | 3.0     |
| 115                    | $3.0 \times 10^2$          | 0.999 | 4.0     |
| 125                    | $2.8 \times 10^2$          | 0.998 | 5.0     |
| 151                    | $2.4 \times 10^2$          | 0.999 | 6.0     |

Supplementary material Table S2. In accordance with the provisions of IEC62321-8 (student's t-statistic with 99% confidence), LODs were determined by multiplying  $t(n-1, \text{risk rate}) = 3.14$  (risk rate = 0.01) to each the standard deviation.

| Number of test         | DEHP | SCCPs | HBCDD | Deca-BDE |
|------------------------|------|-------|-------|----------|
| n=1                    | 126  | 103   | 136   | 104      |
| n=2                    | 121  | 100   | 138   | 84       |
| n=3                    | 118  | 111   | 129   | 128      |
| n=4                    | 119  | 118   | 121   | 98       |
| n=5                    | 120  | 113   | 115   | 103      |
| n=6                    | 117  | 125   | 122   | 115      |
| n=7                    | 112  | 130   | 98    | 103      |
| Average                | 119  | 114   | 123.  | 105      |
| Standard deviation (t) | 4.23 | 11.1  | 13.8  | 13.7     |
| LOD/ (mg/kg)           | 14.2 | 37.3  | 46.4  | 46.0     |

Supplementary material Table S3. LODs obtained by spiking mixed standard (ca. 200 mg/kg) to PS polymer matrix (0.5 mg). In accordance with the provisions of student's t-statistic with 99% confidence, LODs were determined by multiplying  $t(n-1, \alpha) = 4.54$  ( $\alpha = 0.01$ ) to each the standard deviation of 4 repeated measurements.

|              | DEHP | SCCPs | HBCDD | DecaBDE |
|--------------|------|-------|-------|---------|
| LOD/ (mg/kg) | 53   | 56    | 52    | 42      |