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Characterisation of organic compounds in a nasal aspirator

Sample

A plastic nasal aspirator.

Sample labelling: Blue part, white part and red part
Sample arrival at SP: 2014-06-20
Date of test: 2014-08-04 to 2014-08-07

Assignment

Determination of phthalates and characterization of volatile organic compounds in the three parts of a nasal aspirator.

Method

The sample was cut into pieces < 10 mm and was extracted with dichloromethane. The extract was analysed by GC-MS. For the phthalate determination, diisobutyl phthalate (DIBP) dibutyl phthalate (DBP), dipentyl phthalate (DDP), butylbenzyl phthalate (BBP), di-(2-ethylhexyl) phthalate (DEHP), di-n-octyl phthalate (DNOP), di-isononyl phthalate in (DINP) och di-isodecyl phthalate (DIDP) were used as external standards and DEHP-d4 was used as internal standard.

For the characterisation of volatile organic compounds, the dichloromethane extract was analysed by GC-MS using an external decane standard. The signals were identified by NIST library of mass spectra. These signals were quantified as equivalents of decane.

Results

The results from the phthalate determination is presented in Table 1 and the extraction result is presented in Table 2-4. No phthalate was detected in any of the samples.

The extracts of the blue part contains many signals that seems to be long aliphatic compounds that could come from a mineral oil. The white part shows many signals from esters that are similar to the non-phthalate plasticizer DINCH so it is probable that they also function as plasticizers, which would also explain their high concentration in the sample. The only compound identified in the red part is bumetizole, which is a UV light absorbant.

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Table 1. Results from the phthalate determination.

Phtalate	DIBP	DBP	DDP	BBP	DEHP	DNOP	DINP	DIDP
Blue part (weight-%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
White part (weight-%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Red part (weight-%)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table 2. Results from the characterisation of the blue part.

R.T. (min)	weight-%	Compound identity
19.197	0.07	Unknown
24.956	0.05	long aliphatic compound
25.302	0.09	long aliphatic compound
26.305	0.42	long aliphatic compound
27.021	0.22	long aliphatic compound
27.652	0.17	long aliphatic compound
27.928	0.09	long aliphatic compound

Table 3. Results of the characterisation of the white part.

R.T. (min)	weight-%	Compound identity
25.550	1.2	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-9</u>
25.671	2.4	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-10</u>
25.715	1.1	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-11</u>
25.803	>5	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-12</u>
25.935	>5	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-13</u>
26.084	>5	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-14</u>
26.168	>5	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-15</u>
26.299	>5	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-16</u>
26.348	0.6	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-17</u>
26.429	3.1	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-18</u>
26.566	0.8	1,2-Cyclohexanedicarboxylic acid, bis(2-ethylhexyl) ester <u>Formula: C₂₄H₄₄O₄ MW: 396 CAS#: 84-71-19</u>

Table 4. Results from the characterisation of the red part.

R.T. (min)	weight-%	Compound identity
19.502	0.01	Unknown
21.998	0.02	Unknown
24.953	0.04	Unknown
25.141	0.29	Bumetrizole Formula: C ₁₇ H ₁₈ CIN ₃ O MW: 315 CAS#: 3896-11-5
25.566	0.06	Unknown
25.692	0.16	Unknown
25.827	0.43	Unknown
25.959	0.49	Unknown
26.115	0.51	Unknown
26.204	0.51	Unknown
26.335	0.34	Unknown
26.382	0.04	Unknown
26.465	0.26	Unknown
26.600	0.09	Unknown

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