

Contact person RISE
Fredrik Wångsell
Chemistry and Materials
+46 10 516 65 54
fredrik.wangsell@ri.se

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JAWPEER AB
Peer Nordbäck
Björkhagsvägen 75
186 35 Vallentuna

Analysis of leachable cyclic siloxanes (D3-D6) in two samples

Assignment

To analyze two samples to determine if any leachable linear (L3-L6) or cyclic (D3-D6) siloxanes are released from the material during a simulated chewing procedure (800 N pressure, 1000 repetitions at constant temperature at 37 °C) in MQ-water.

Sample

Sample identification: Two samples, named “blue” (1 and 2) and “white” (3 and 4)
Arrived at RISE: 2020-04-21
Date of experiment and analysis: 2020-04-22 to 2020-04-24



Figure 1. Pictures of the samples, 1 and 2 “blue”, 3 and 4 “white”.

RISE Research Institutes of Sweden AB

Postal address	Office location	Phone / Fax / E-mail
Box 857	Brinellgatan 4	+46 10 516 50 00
SE-501 15 BORÅS	SE-504 62 BORÅS	+46 33 13 55 02
Sweden		info@ri.se

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Experimental and Methods

A custom made experimental setup was built up with a pressure of 800 N on the sample (double samples) and with 1000 repetitions which was placed in an oven with constant temperature of 37 °C. The water that was used contained internal which was used for the samples and for the standards used for calibration (4 compounds, D3, D4, D5 and D6, in three different concentrations), the standards were treated in the same way as the samples.



Figure 2. Picture of the container in which the samples were placed.



Figure 3. Picture of the experimental setup in an oven (37 °C).

Results

The mass of the dry sample before and after leaching is presented in table 1

Table 1

Sample	m (g) before	m (g) after	%-diff
1 (blue)	1,7115	1,7107	-0,05
2 (blue)	1,7104	1,7086	-0,11
3 (white)	1,8023	1,801	-0,07
4 (white)	1,8034	1,7992	-0,23

The result of the quantification (mean value of the double sample) of siloxanes (D3-D6) are presented in table 2.

Table 2

Sample	D3 (mg/kg)	D4 (mg/kg)	D5 (mg/kg)	D6 (mg/kg)
Blue (mean of 1 and 2)	<1,0	<1,0	<1,0	<1,0
White (mean of 3 and 4)	<1,0	<1,0	<1,0	<1,0

LOQ (limit of quantification): D3 (1,0 mg/kg), D4 (1,0 mg/kg), D5 (1,0 mg/kg), D6 (1,0 mg/kg).

No linear siloxanes were found, D7-D10 were identified in the “Blue sample” but below LOQ (1,0 mg/kg).

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Performed by

Fredrik Wångsell