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Date

2018-12-13

Reference

8P01568

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Add-X

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Testing of oxo-biodegradability SASO 2879

Material

Material was sent from Add-X to RISE in October 2018.

The material was kept in a standard atmosphere (23 ± 2 °C and 50 ± 10 % RH) until the tests were started.

Testing

UV ageing was performed by exposing the samples according to ASTM D 5208/2016 cycle C, using a *Q-LAB QUV* equipped with UVA 340-peak lamps. The samples were exposed consisted for 312 hours to UV-light with an irradiance of 0.78 ± 0.02 W/m² at 340 nm.

The exposure was carried out as follows:

Material	Total exposure time	Dates	Equipment
1	UV 312 hours	October 30 th to November 12 th , 2018	Q-LAB QUV

Chemical composition was determined on the unexposed material according to the description below.

Mercury (Hg) was determined by a Direct Mercury Analyzer according to SP-method 3505. Arsenic (As), lead (Pb), cadmium (Cd), cobalt (Co), copper (Cu), chrome (Cr), molybdenum (Mo), nickel (Ni), selenium (Se), zinc (Zn) was determined by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) after microwave digestion of the sample in acid.

Fluor (F) was determined by combustion in a bomb followed by determination of fluoride ion chromatography with conductivity.

SEC analysis was performed by Chalmers Technical University using an an Agilent PL-GPC 220 Integrated HT-GPC. Solvent: 1,2,4-trichlorobenzene in 150 C, with Santonox as stabiliser. Sample concentration: 1g/l. Dissolving time: 3 h in 140 C in nitrogen atmosphere. Calibration: Polystyrene standards with universal calibration. Technician: Anders Mårtensson, Chalmers.

Determination of the gel content in the UV exposed material was performed using SP Method 4913. A representative sample from the material after the UV exposure test was weighed and dissolved in a nonreactive solvent. The gel was separated by filtration and dried until constant weight. The amount of gel is reported as a weight fraction of the total sample.

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Results

Chemical analysis

The non-aged material was chemically analysed and the material meet the requirements.

Table 1. Content of elements in the original materials

	Requiment max (mg/kg)	
As	5	<0,5
Cd	0.5	<0,2
Cr	50	<1
Cu	50	18
Mo	1	<0,5
Ni	25	<0,5
Pb	50	<0,4
Se	0.75	<0,4
Zn	150	68
Hg	0.5	<0,5
F	100	<0,01
Co	38	<0,5

Gel content

Gel content at the end of the UV-exposure (312 h) as reported below. The requirement is gel content <5%

Table 4. Results of gel content determination at end of ageing

Material	Gel content (%)
1	1,1±0,4

Molecular weight

Mw, Mn and polydispersive index (PDI) after 312 h of UV-exposure as reported below. The Mw value represents a molecular mass distribution and is measured with PS standards for calibration. The test method applied, implies that obtained value is only approximate. For this reason we consider that the result meets the requirements of the SASO specifications (UAE.S 5009/2009).

Table 5. Results of Mw, Mn and PDI at the end of UV-exposure

Material	Mw	Mn	PDI
	5246	414	12,7

Conclusions

The material meets the SASO 2879 criteria for chemical composition, gel content and molecular weight.

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