O Ü E c o L a b o r

Determining the velocity of bioremediation of petroleum products in used sorbent.

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According to contract of Oy Operative Recovery Solutions JMR Ltd and Ecolabor was the object of contractual project to examine the velocity of biodegradation of petroleum products, connected in hardly contaminated hydrophobic sorbent.

For experimenting were from ORS-Sorb absorbent presented six (6) different samples, including oil contaminated sorbent and textile with polysaccharide membrane in equal amounts. The mass of all materials was 148,79 g (79,07g textile with membrane and 69,72g sorbent). According to customers desire the experiments were carried out with an avarage sample, mixing all 6 samples .

Relying on literature (1-4) and laboratorys experience it was presumed, that biodegradation in hydrophobic medium will proceed slow. The laboratory decided to make in addition a parallel experiment, where the accelerator of biodegradation - "Hydrobreak Plus" was added in the amount of 1% of sample.

Experiment method.

The experiments were carried out in room isolated from air, where was guaranteed relieving CO_2 with O_2, to ensure constant partial pressure of O_2 during the experiment. The temperature of experiment was $20\pm2\ ^{o}C$.

Experimental material was during the experiment time in the media of saturated water vapour.

In the course of experiment was determined the containing of petroleum products in sample once in a month (3g) both from textile and from sorbent. The containing of petroleum products was determined IR-spectrophotometrically and in addition in august and october gaschromatographically.

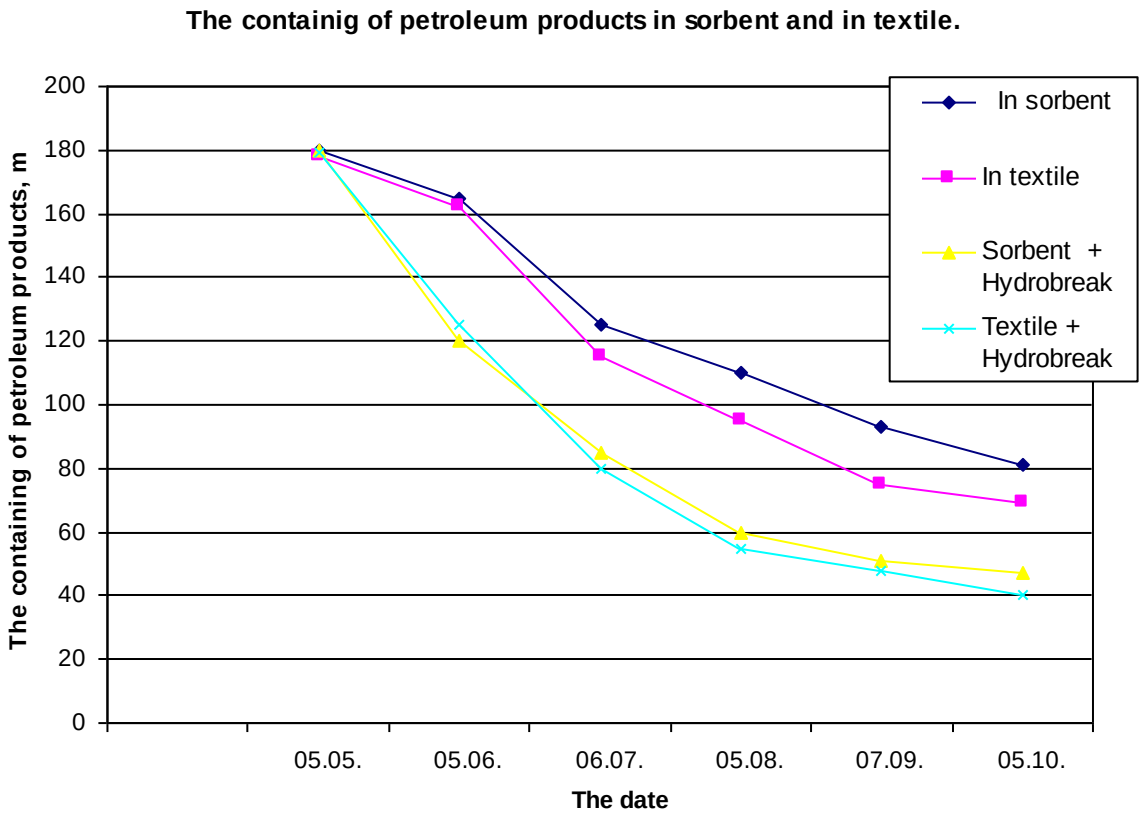
Conclusion.

1. The biodegradation of petroleum products in tested sample proceeds relative slow. Hydrobreak Plus addition had accelerated the process considerable.
2. The reason of slow velocity of biodergatation is the high hydrophobity of the medium. The additing of hydropfilic supplement Hydrobreak Plus accelerated biodegradation essential.
3. It is recommendable to add for speed up biodegradation a hydrophilic component, what may be e.q. sawdust, smashed bark, peat, soil etc. The relation of added material and sorbent may be e.q. 1:1.
4. During the experiment period was the biodegradation of polysaccharide membrane on visual assesment more then a half .
5. All the above-given recommendations are with qualitativ nature and require for optimization.

Results

The results of analyses (mg petroleum products in 1g sample) are given in table and presented on figure:

The date of analysis	In sorbent	In textile	Sorbent + Hydrobreak	Textile + Hydrobreak
05.05.	180	178	180	179
05.06.	165	162	120	125
06.07.	125	115	85	80
05.08.	110	95	60	55
07.09.	93	75	51	48
05.10.	81	69	47	40


The containig of petroleum products in sorbent and in textile.
The containing of petroleum products, m
200
180
160
140
120
100
80
60
40
20
0
05.05.
05.06.
06.07.
05.08.
07.09.
05.10.
The date
In sorbent
In textile
Sorbent + Hydrobreak
Textile + Hydrobreak

Literature.

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