

Accepted Manuscript

Lightweight, mechanical robust foam with a herringbone-like porous structure for oil/water separation and filtering

Xiaohan Cao, Pengfei Zhan, Xiangdong Wei, Wei Zhai, Guoqiang Zheng, Kun Dai, Chuntai Liu, Changyu Shen



PII: S0142-9418(18)31133-4

DOI: [10.1016/j.polymertesting.2018.09.033](https://doi.org/10.1016/j.polymertesting.2018.09.033)

Reference: POTE 5631

To appear in: *Polymer Testing*

Received Date: 18 July 2018

Revised Date: 16 September 2018

Accepted Date: 29 September 2018

Please cite this article as: X. Cao, P. Zhan, X. Wei, W. Zhai, G. Zheng, K. Dai, C. Liu, C. Shen, Lightweight, mechanical robust foam with a herringbone-like porous structure for oil/water separation and filtering, *Polymer Testing* (2018), doi: <https://doi.org/10.1016/j.polymertesting.2018.09.033>.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Lightweight, mechanical robust foam with a herringbone-like porous structure for oil/water separation and filtering

Xiaohan Cao ¹, Pengfei Zhan ¹, Xiangdong Wei, Wei Zhai, Guoqiang Zheng, Kun Dai*, Chuntai Liu, Changyu Shen

School of Materials Science and Engineering, The Key Laboratory of Advanced Materials Processing & Mold of Ministry of Education, Zhengzhou University, Zhengzhou, 450001, PR China

Abstract: The advancement of the super absorbent materials with a prominent mechanical robustness for oil-water separation is urgently needed because marine oil-spillage and industrial oily-wastewater have aroused great attention. In this work, a lightweight carbon nanotubes (CNTs)/ thermoplastic polyurethane (TPU)/epoxy (EP) composite foam with a novel three-dimensional (3D) herringbone-like structure was successfully fabricated via a simple and facile ice-templating method for oil absorption and oil-water separation. The density and porosity of the sample are 0.11g cm⁻³ and 63%, respectively. The durability of the as-prepared porous foams was demonstrated by repeated mechanical compressions in air and organic solvent, respectively. The influence of the varied CNTs and EP content on the water contact angle (WCA) of the composite foams were investigated. The composite foams are of sufficient oil absorption capacity and high selectivity due to their particular wettability and high porosity. Moreover, the hydrophobic foams can rapidly and selectively absorb a variety of oils and organic solvents, and the adsorbates can be

* Corresponding author.
E-mail: kundai@zzu.edu.cn

¹ These authors contributed equally.

Download English Version:

<https://daneshyari.com/en/article/11263244>

Download Persian Version:

<https://daneshyari.com/article/11263244>

[Daneshyari.com](https://daneshyari.com)