**Synthesis of activated carbon foams with high specific surface area using polyurethane elastomer templates for effective removal of methylene blue**

Mahitha Udayakumara, b, Bilal El Mrabatea, b, Tamás Koósc, Katalin Szemmelveiszc, Ferenc Kristályd, Máté Leskód, Ádám Filepa, Róbert Gébere, Mateusz Schabikowskif, Péter Baumlig, János Lakatosb, Pál Tóthc, Zoltán Németha\*

a Advanced Materials and Intelligent Technologies Higher Education and Industrial Cooperation Centre, University of Miskolc, H-3515 Miskolc, Hungary

b Institute of Chemistry, University of Miskolc, H-3515 Miskolc, Hungary

c Department of Combustion Technology and Thermal Energy, University of Miskolc, H-3515 Miskolc, Hungary

d Institute of Mineralogy and Geology, University of Miskolc, H-3515 Miskolc, Hungary

e Institute of Ceramic and Polymer Engineering, University of Miskolc, H-3515 Miskolc, Hungary

f Institute of Nuclear Physics, Polish Academy of Sciences, PL 31-342 Krakow, Poland

g Institute of Physical Metallurgy, Metal Forming and Nanotechnology, University of Miskolc, H-3515 Miskolc, Hungary

\*Corresponding author: Tel: +36 46 565 111/1380. E-mail: [kemnemet@uni-miskolc.hu](mailto:kemnemet@uni-miskolc.hu)

1. **The density of carbon foams**

The densities of the CF are given in Table S1. The samples prepared through direct activation (EFAC1) were denser than the carbonized (EF900) and the activated CF (EFAC2) prepared in the two-step process.

**Table S1.** The density of CF

|  |  |
| --- | --- |
| Samples | Density (g/cm3) |
| EF700 | 1.46 |
| EF900 | 1.61 |
| EFAC1 | 1.81 |
| EFAC2 | 1.78 |

1. **Raman spectroscopy**

**Table S2.** The ratio of Raman intensities.

|  |  |  |  |
| --- | --- | --- | --- |
| Sample | ID | IG | ID/IG ratio |
| EF700 | 0.899 | 1.0 | 0.899 |
| EF900 | 0.929 | 1.0 | 0.929 |
| EFAC | 0.998 | 0.965 | 1.034 |
| EF1500 | 0.998 | 0.947 | 1.054 |

1. **Wettability**

**Table S3.** Contact angles of carbonized and activated samples

|  |  |  |
| --- | --- | --- |
| Samples | Edge angle  (Circle), (°) | Edge angle  (Young-Laplace), (°) |
| EF700 | 93 | 88 |
| EF900 | 65 | 56 |
| EFAC1 | 41 | 33 |
| EFAC2 | 0 | 0 |

1. **Adsorption isotherm**

The equation of Langmuir isotherm is given as follows:

|  |  |
| --- | --- |
|  | (S1) |

|  |  |
| --- | --- |
|  | (S2) |

where qe is the amount of MB adsorbed at equilibrium (mg/g), Ce is the equilibrium concentration of the MB (mg/L), qm is the maximum adsorption capacity (mg/g) and KL is the Langmuir equilibrium constant (L/mg). RL is the separation factor and Ci is the initial concentration of MB (mg/L). The value of RL indicates the type of the isotherm to be either unfavourable (RL > 1), linear (RL = 1), favourable (0 < RL < 1) or irreversible (RL = 0) (Geçgel et al., 2013).

The Freundlich isotherm can be described as follows:

|  |  |
| --- | --- |
|  | (S3) |

where KF and n are the Freundlich characteristic constants that represent the adsorption capacity and the adsorption intensity, respectively.

|  |  |
| --- | --- |
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| **D:\Primary files\Carbon article_Final\Submitted journals - carbon foam\Arabian journal of chemistry\Final\Revision\New folder\linear curve FREUNDLICH EFAC1.tif**  **(c)** | **D:\Primary files\Carbon article_Final\Submitted journals - carbon foam\Arabian journal of chemistry\Final\Revision\New folder\linear curve FREUNDLICH EFAC2.tif**  **(d)** |

**Figure S1.** Langmuir (**a** and **b**) and Freundlich (**c** and **d**) linear fits for MB adsorption on the obtained ACF.

**Reference**

Geçgel, Ü., Özcan, G., Gürpnar, G.Ç., 2013. Removal of methylene blue from aqueous solution by activated carbon prepared from pea shells (Pisum sativum). J. Chem. https://doi.org/10.1155/2013/614083