

Supplementary Materials: Sorption of Methylene Blue for Studying the Specific Surface Properties of Biomass Carbohydrates

Tatiana Skripkina ^{1,*}, Ekaterina Podgorbunskikh ¹, Aleksey Bychkov ^{1,2}, and Oleg Lomovsky ¹

¹ Institute of Solid State Chemistry and Mechanochemistry SB RAS, Kutateladze 18, 630128 Novosibirsk, Russia; podgorbunskikh@solid.nsc.ru (E.P.); bychkov_a@solid.nsc.ru (A.B.); lomov@solid.nsc.ru (O.L.)

² Faculty of Business, Novosibirsk State Technical University, 20 Prospekt K. Marksa, 630073 Novosibirsk, Russia

* Correspondence: skripkinats@solid.nsc.ru

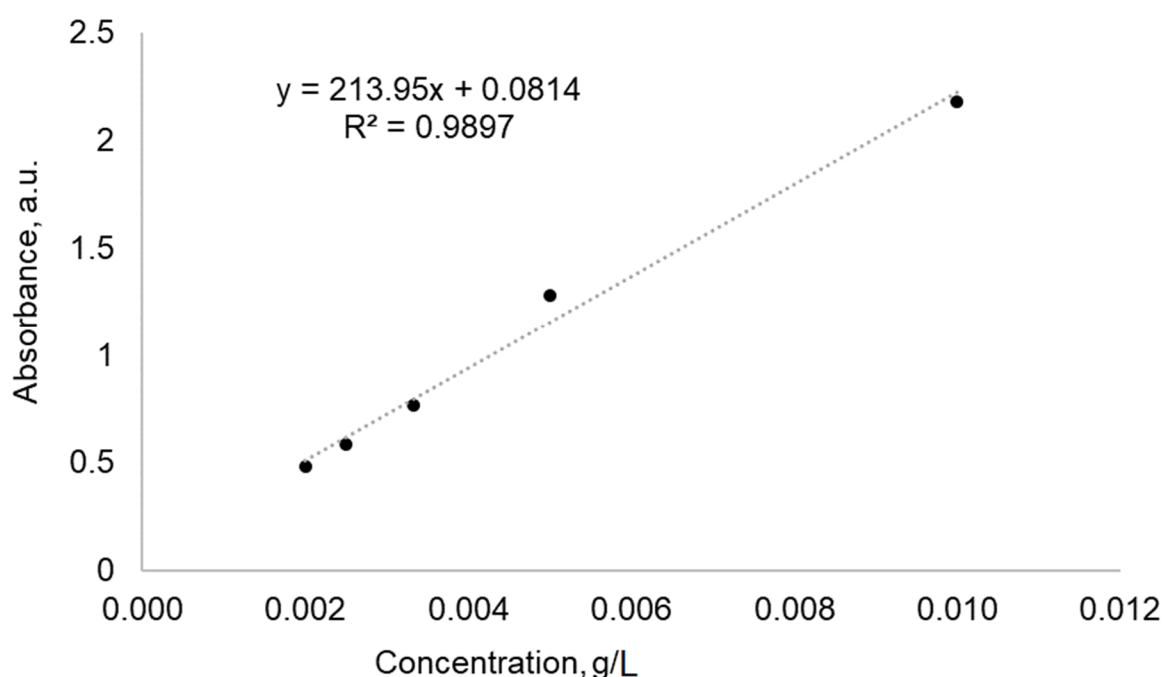


Figure S1. A calibration plot for determining methylene blue concentration in ethanol, $\lambda = 660$ nm.

Solutions having concentrations 0.01, 0.005, 0.0033, 0.0025, and 0.002 g/L were prepared to plot the calibration curves showing the absorbance of solutions in water and ethanol. The calibration curves were plotted using freshly prepared solutions prior to every new measurement to avoid pigment adsorption onto laboratory glassware during storage. The calibration plots was approximated by a straight line with the R-squared value = 0.99.

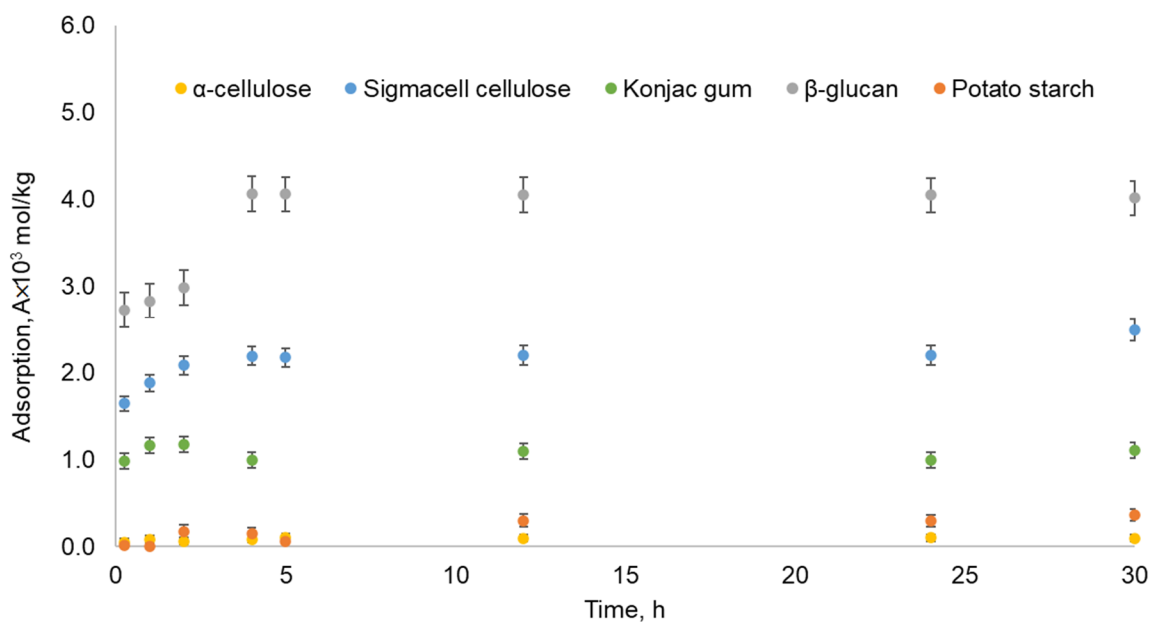


Figure S2. The isothermal kinetics of sorption of methylene blue onto biomass carbohydrates in ethanol.

Table S1. The raw data on the values of the optical density of the solutions at $\lambda = 660$ nm after 96 h of sorption of methylene blue.

Sample	Dilution, times	Optical Density, $\lambda = 660$				The Average
α -cellulose	20	1.064	1.0714	1.0673	1.0677	1.0676
Sigmacell cellulose	20	0.7781	0.7607	0.753	0.7636	0.7639
Konjac gum	20	1.0256	1.0396	1.0261	1.0468	1.0345
β -glucan	20	0.9419	0.9446	0.9359	0.9505	0.9432
Potato starch	20	1.1013	1.0635	1.059	1.0213	1.0613
Control sample	20	1.0710	1.0647	1.0558	1.0919	1.0708

Table S2. The calculation of the values of the sorption of methylene blue (MB) from the data of Table S1.

Sample	Concentration, g/L, Diluted	Concentration, g/L, Real	$m(\text{MB})_{\text{init}}$, g	$m(\text{MB})_{\text{end}}$, g, Subject to Control	Sorption, g/g	Sorption, $A \times 10^3$ mmol/g
α -cellulose	5.10E-03	1.02E-01	1.00E-02	9.97E-03	3.20E-05	0.10
Sigmacell cellulose	3.58E-03	7.15E-02	1.00E-02	6.91E-03	3.10E-03	9.7
Konjac gum	4.94E-03	9.88E-02	1.00E-02	9.63E-03	3.52E-04	1.1
β -glucan	4.48E-03	8.96E-02	1.00E-02	8.72E-03	1.28E-03	4.0
Potato starch	5.07E-03	1.01E-01	1.00E-02	9.90E-03	9.60E-05	0.3
Control sample	5.12E-03	1.02E-01	1.00E-02	-	-	-

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).