**Supplementary Materials**

**Surface Thermodynamic Properties of Styrene–Divinylbenzene Copolymer Modified by** S**upramolecular** S**tructure of** **Melamine using Inverse Gas Chromatography**

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**Table S1.** Values of $RTlnVn$ (kJ/mol) of n-alkanes adsorbed on silica particles as a function of the temperature

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| **Dowex L-285** |
| Solvents | 443.15K | 453.15K | 463.15K | 473.15K |  |
| n-Hexane | 24.005 | 23.280 | 22.856 | 22.233 |   |
| n-Heptane | 28.415 | 27.432 | 25.977 | 25.183 |   |
| n-Octane | 34.457 | 33.120 | 30.253 | 29.225 |   |
| n-Nonane | 38.251 | 36.693 | 32.938 | 31.763 |   |
| Cyclohexane | 21.129 | 20.571 | 20.821 | 20.309 |   |
| Benzene | 18.494 | 18.091 | 18.956 | 18.546 |   |
| Toluene | 21.666 | 21.077 | 21.200 | 20.667 |   |
| Ethyl acetate | 16.262 | 15.989 | 17.377 | 17.053 |   |
| Ethanol | 5.332 | 5.698 | 9.642 | 9.740 |   |
| n-Propanol | 10.156 | 10.239 | 13.054 | 12.965 |   |
| i-Propanol | 9.595 | 9.712 | 12.659 | 12.591 |   |
| n-Butanol | 15.458 | 15.232 | 16.807 | 16.514 |   |
| i-Butanol | 14.571 | 14.396 | 16.180 | 15.921 |   |
| n-Pentanol | 20.636 | 20.107 | 20.472 | 19.979 |   |
| i-Pentanol | 19.792 | 19.312 | 19.875 | 19.414 |   |
| Pyridine | 16.250 | 15.977 | 17.368 | 17.044 |   |
| Dichloromethane | 11.991 | 11.968 | 14.358 | 14.200 |   |
| **1% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| n-Hexane | 20.024 | 20.210 | 19.998 | 19.776 | 18.582 |
| n-Heptane | 24.234 | 23.957 | 23.697 | 23.412 | 21.373 |
| n-Octane | 27.857 | 27.182 | 26.880 | 26.541 | 23.775 |
| n-Nonane | 32.821 | 31.601 | 31.241 | 30.828 | 27.066 |
| Cyclohexane | 35.938 | 34.376 | 33.980 | 33.521 | 29.132 |
| Benzene | 21.870 | 21.853 | 21.620 | 21.370 | 19.806 |
| Toluene | 19.706 | 19.927 | 19.719 | 19.501 | 18.371 |
| Ethyl acetate | 22.311 | 22.246 | 22.008 | 21.751 | 20.098 |
| Ethanol | 17.871 | 18.294 | 18.108 | 17.917 | 17.157 |
| n-Propanol | 8.894 | 10.303 | 10.220 | 10.163 | 11.204 |
| i-Propanol | 12.859 | 13.832 | 13.704 | 13.587 | 13.832 |
| n-Butanol | 12.391 | 13.415 | 13.292 | 13.183 | 13.521 |
| i-Butanol | 17.216 | 17.710 | 17.531 | 17.350 | 16.721 |
| Dichloromethane | 16.477 | 17.052 | 16.882 | 16.711 | 16.229 |
| **2% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| n-Hexane | 17.539 | 17.245 | 17.504 | 17.209 | 14.712 |
| n-Heptane | 20.970 | 20.745 | 20.933 | 20.588 | 18.000 |
| n-Octane | 23.924 | 23.759 | 23.883 | 23.497 | 20.830 |
| n-Nonane | 27.970 | 27.887 | 27.926 | 27.482 | 24.708 |
| Cyclohexane | 30.512 | 30.479 | 30.464 | 29.985 | 27.142 |
| Benzene | 19.043 | 18.779 | 19.007 | 18.690 | 16.154 |
| Toluene | 17.279 | 16.980 | 17.245 | 16.953 | 14.464 |
| Ethyl acetate | 19.406 | 19.149 | 19.369 | 19.047 | 16.501 |
| Ethanol | 15.786 | 15.456 | 15.754 | 15.482 | 13.033 |
| n-Propanol | 8.465 | 7.987 | 8.438 | 8.270 | 6.015 |
| i-Propanol | 11.703 | 11.290 | 11.673 | 11.458 | 9.117 |
| n-Butanol | 11.342 | 10.922 | 11.313 | 11.105 | 8.774 |
| i-Butanol | 15.254 | 14.913 | 15.221 | 14.956 | 12.520 |
| Dichloromethane | 14.660 | 14.307 | 14.628 | 14.372 | 11.952 |
| **3% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| n-Hexane | 19.434 | 18.763 | 18.809 | 18.682 | 18.206 |
| n-Heptane | 23.098 | 22.445 | 22.427 | 22.182 | 21.769 |
| n-Octane | 26.252 | 25.613 | 25.542 | 25.194 | 24.835 |
| n-Nonane | 30.573 | 29.955 | 29.810 | 29.322 | 29.036 |
| Cyclohexane | 33.287 | 32.681 | 32.489 | 31.913 | 31.674 |
| Benzene | 21.040 | 20.378 | 20.395 | 20.217 | 19.768 |
| Toluene | 19.158 | 18.486 | 18.536 | 18.419 | 17.938 |
| Ethyl acetate | 21.424 | 20.763 | 20.774 | 20.583 | 20.141 |
| Ethanol | 17.562 | 16.883 | 16.960 | 16.895 | 16.386 |
| n-Propanol | 9.749 | 9.033 | 9.242 | 9.429 | 8.785 |
| i-Propanol | 13.201 | 12.500 | 12.651 | 12.726 | 12.140 |
| n-Butanol | 12.795 | 12.093 | 12.250 | 12.338 | 11.746 |
| i-Butanol | 16.993 | 16.311 | 16.396 | 16.348 | 15.828 |
| Dichloromethane | 16.352 | 15.667 | 15.763 | 15.736 | 15.205 |
| **4% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| n-Hexane | 20.134 | 19.612 | 19.580 | 19.192 | 17.679 |
| n-Heptane | 24.100 | 23.616 | 23.477 | 23.084 | 20.677 |
| n-Octane | 27.514 | 27.063 | 26.832 | 26.434 | 23.258 |
| n-Nonane | 32.191 | 31.786 | 31.428 | 31.023 | 26.794 |
| Cyclohexane | 35.128 | 34.751 | 34.314 | 33.905 | 29.014 |
| Benzene | 21.874 | 21.369 | 21.290 | 20.900 | 18.995 |
| Toluene | 19.836 | 19.311 | 19.287 | 18.900 | 17.454 |
| Ethyl acetate | 22.296 | 21.795 | 21.704 | 21.314 | 19.315 |
| Ethanol | 18.106 | 17.563 | 17.586 | 17.201 | 16.146 |
| n-Propanol | 9.656 | 9.030 | 9.280 | 8.907 | 9.757 |
| i-Propanol | 13.397 | 12.807 | 12.957 | 12.578 | 12.586 |
| n-Butanol | 12.955 | 12.361 | 12.523 | 12.145 | 12.251 |
| i-Butanol | 17.497 | 16.948 | 16.987 | 16.602 | 15.685 |
| Dichloromethane | 16.800 | 16.244 | 16.302 | 15.918 | 15.157 |

**Table S2.** Variations of $∆G\_{a}^{sp}\left(T\right) (kJ/mol)$ of different polar solvents adsorbed on Dowex L-285 and various melamine percentages as a function of temperature.

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| **Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| Cyclohexane | 1.348 | 1.325 | 1.303 | 1.280 | 1.258 |
| Benzene | 0.364 | 0.358 | 0.353 | 0.347 | 0.342 |
| Toluene | 1.734 | 1.536 | 1.338 | 1.140 | 0.942 |
| Ethyl acetate | 10.106 | 9.593 | 9.079 | 8.566 | 8.052 |
| Ethanol | 11.125 | 10.220 | 9.315 | 8.410 | 7.505 |
| n-Propanol | 5.054 | 4.241 | 3.427 | 2.614 | 1.800 |
| i-Propanol | 9.726 | 8.890 | 8.055 | 7.219 | 6.384 |
| n-Butanol | 3.395 | 2.927 | 2.459 | 1.991 | 1.523 |
| i-Butanol | 9.307 | 8.678 | 8.048 | 7.419 | 6.789 |
| n-Pentanol | 2.974 | 2.802 | 2.630 | 2.458 | 2.286 |
| i-Pentanol | 7.992 | 7.558 | 7.124 | 6.690 | 6.256 |
| Pyridine | 10.306 | 9.575 | 8.843 | 8.112 | 7.380 |
| Dichloromethane | 15.274 | 15.239 | 15.204 | 15.169 | 15.134 |
| **1% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| Cyclohexane | 0.779 | 0.774 | 0.769 | 0.764 | 0.759 |
| Benzene | 0.447 | 0.434 | 0.421 | 0.408 | 0.395 |
| Toluene | 1.532 | 1.460 | 1.389 | 1.317 | 1.246 |
| Ethyl acetate | 8.503 | 8.378 | 8.253 | 8.128 | 8.003 |
| Ethanol | 12.783 | 12.128 | 11.473 | 10.818 | 10.163 |
| n-Propanol | 9.446 | 8.761 | 8.076 | 7.391 | 6.706 |
| i-Propanol | 6.214 | 5.554 | 4.894 | 4.234 | 3.574 |
| n-Butanol | 7.988 | 7.483 | 6.978 | 6.473 | 5.968 |
| i-Butanol | 3.733 | 3.113 | 2.493 | 1.873 | 1.253 |
| Dichloromethane | 15.6085 | 15.559 | 15.509 | 15.459 | 15.409 |
| **2% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| Cyclohexane | 0.406 | 0.396 | 0.386 | 0.376 | 0.366 |
| Benzene | 0.286 | 0.271 | 0.256 | 0.241 | 0.226 |
| Toluene | 3.771 | 3.691 | 3.611 | 3.531 | 3.451 |
| Ethyl acetate | 9.667 | 9.507 | 9.347 | 9.187 | 9.027 |
| Ethanol | 10.070 | 9.020 | 7.970 | 6.920 | 5.870 |
| n-Propanol | 12.489 | 11.464 | 10.439 | 9.414 | 8.389 |
| i-Propanol | 30.875 | 30.160 | 29.445 | 28.730 | 28.015 |
| n-Butanol | 11.446 | 10.516 | 9.586 | 8.656 | 7.726 |
| i-Butanol | 16.083 | 15.308 | 14.533 | 13.758 | 12.983 |
| Dichloromethane | 24.34935 | 24.294 | 24.239 | 24.184 | 24.129 |
| **3% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| Cyclohexane | 0.617 | 0.605 | 0.593 | 0.581 | 0.569 |
| Benzene | 1.374 | 1.359 | 1.344 | 1.329 | 1.314 |
| Toluene | 1.192 | 1.030 | 0.868 | 0.706 | 0.544 |
| Ethyl acetate | 10.567 | 10.314 | 10.060 | 9.807 | 9.553 |
| Ethanol | 15.627 | 14.064 | 12.502 | 10.939 | 9.377 |
| n-Propanol | 12.522 | 10.977 | 9.432 | 7.887 | 6.342 |
| i-Propanol | 10.925 | 9.518 | 8.110 | 6.703 | 5.295 |
| n-Butanol | 11.291 | 9.891 | 8.491 | 7.091 | 5.691 |
| i-Butanol | 9.549 | 8.284 | 7.019 | 5.754 | 4.489 |
| Dichloromethane | 9.737 | 9.352 | 8.967 | 8.582 | 8.197 |
| **4% Melamine on Dowex L-285** |
| Solvents | 453.15K | 458.15K | 463.15K | 468.15K | 473.15K |
| Cyclohexane | 1.742 | 1.741 | 1.739 | 1.738 | 1.736 |
| Benzene | 2.164 | 2.139 | 2.114 | 2.089 | 2.064 |
| Toluene | 8.699 | 8.539 | 8.379 | 8.219 | 8.059 |
| Ethyl acetate | 8.371 | 8.061 | 7.751 | 7.441 | 7.131 |
| Ethanol | 20.283 | 19.048 | 17.813 | 16.578 | 15.343 |
| n-Propanol | 22.080 | 20.900 | 19.720 | 18.540 | 17.360 |
| i-Propanol | 18.025 | 16.950 | 15.875 | 14.800 | 13.725 |
| n-Butanol | 16.621 | 15.566 | 14.511 | 13.456 | 12.401 |
| i-Butanol | 11.625 | 10.600 | 9.575 | 8.550 | 7.525 |
| Dichloromethane | 19.157 | 18.837 | 18.517 | 18.197 | 17.877 |

**Table S3.** Values of $γ\_{s}^{+}(T)$, $γ\_{s}^{-}(T)$, $γ\_{s}^{AB}(T)$, $γ\_{s}^{d} (T)$, and $γ\_{s}^{tot.}(T)$ of Dowex L-285 and the different percentages of melamine on the copolymer.

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| **Dowex L-285** |
| T(K) | $γ\_{s}^{-}(T)$  | $γ\_{s}^{+}(T)$  | $$γ\_{s}^{AB}(T)$$ | $$γ\_{s}^{d} (T)$$ | $$γ\_{s}^{tot.}(T)$$ |
| 453.15 | 143.17 | 11.61 | 81.54 | 104.03 | 185.57 |
| 458.15 | 140.35 | 10.37 | 76.29 | 99.85 | 176.14 |
| 463.15 | 137.59 | 9.20 | 71.17 | 95.68 | 166.85 |
| 468.15 | 134.90 | 8.12 | 66.19 | 91.50 | 157.69 |
| 473.15 | 132.28 | 7.11 | 61.33 | 87.33 | 148.66 |
| **1% Melamine on Dowex L-285** |
| T(K) | $γ\_{s}^{-}(T)$  | $γ\_{s}^{+}(T)$  | $$γ\_{s}^{AB}(T)$$ | $$γ\_{s}^{d} (T)$$ | $$γ\_{s}^{tot.}(T)$$ |
| 453.15 | 149.51 | 8.22 | 70.11 | 85.16 | 155.28 |
| 458.15 | 146.29 | 7.91 | 68.03 | 80.69 | 148.72 |
| 463.15 | 143.15 | 7.60 | 65.99 | 76.14 | 142.13 |
| 468.15 | 140.10 | 7.31 | 64.00 | 71.59 | 135.59 |
| 473.15 | 137.12 | 7.02 | 62.07 | 67.04 | 129.10 |
| **2% Melamine on Dowex L-285** |
| T(K) | $γ\_{s}^{-}(T)$  | $γ\_{s}^{+}(T)$  | $$γ\_{s}^{AB}(T)$$ | $$γ\_{s}^{d} (T)$$ | $$γ\_{s}^{tot.}(T)$$ |
| 453.15 | 363.86 | 10.62 | 124.35 | 44.44 | 168.79 |
| 458.15 | 356.69 | 10.18 | 120.53 | 42.39 | 162.93 |
| 463.15 | 349.71 | 9.75 | 116.81 | 36.22 | 153.03 |
| 468.15 | 342.90 | 9.34 | 113.18 | 34.99 | 148.16 |
| 473.15 | 336.25 | 8.94 | 109.63 | 31.75 | 141.38 |
| **3% Melamine on Dowex L-285** |
| T(K) | $γ\_{s}^{-}(T)$  | $γ\_{s}^{+}(T)$  | $$γ\_{s}^{AB}(T)$$ | $$γ\_{s}^{d} (T)$$ | $$γ\_{s}^{tot.}(T)$$ |
| 453.15 | 58.19 | 12.69 | 54.36 | 64.53 | 118.89 |
| 458.15 | 52.86 | 11.98 | 50.34 | 62.61 | 112.95 |
| 463.15 | 47.86 | 11.30 | 46.51 | 57.76 | 104.27 |
| 468.15 | 43.18 | 10.64 | 42.87 | 51.14 | 94.01 |
| 473.15 | 38.81 | 10.01 | 39.41 | 49.60 | 89.02 |
| **4% Melamine on Dowex L-285** |
| T(K) | $γ\_{s}^{-}(T)$  | $γ\_{s}^{+}(T)$  | $$γ\_{s}^{AB}(T)$$ | $$γ\_{s}^{d} (T)$$ | $$γ\_{s}^{tot.}(T)$$ |
| 453.15 | 225.23 | 7.97 | 84.71 | 75.60 | 160.31 |
| 458.15 | 214.45 | 7.32 | 79.24 | 74.09 | 153.33 |
| 463.15 | 204.09 | 6.71 | 73.99 | 67.00 | 140.99 |
| 468.15 | 194.14 | 6.13 | 68.97 | 63.23 | 132.20 |
| 473.15 | 184.58 | 5.58 | 64.16 | 59.12 | 123.28 |