Supporting Information

Pressurized carbonization of mixed plastics into porous carbon sheets on magnesium oxide

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Table S1. Compounds of the liquid products from carbonization of the mixed plastics and MgO at 500 °C in relation to reaction time.

| Elution time (min) | Substance | Portion of the total chromatographic peak area (%) |
|--------------------|-----------|--------------------------------------------------|
| 2.012              | Benzene, | 0 | 2.221 | 0 | 0 |
| 2.883              | Toluene, | 0 | 6.583 | 0 | 0 |
| 4.346              | Ethylbenzene, | 0 | 5.259 | 0 | 0 |
| 4.477              | 1,3-Dimethylbenzene, | 0 | 4.754 | 0 | 0 |
| 4.877              | Styrene, | 0 | 2.511 | 0 | 0 |
| 6.196              | 1-Ethyl-3methylbenzene, | 0 | 0.941 | 0 | 0 |
| 6.314              | 1, 2, 4-Trimethylbenzene, | 0 | 0.664 | 0 | 0 |
| 6.570              | Methylstyrene, | 0 | 0.762 | 0 | 0 |
| 6.687              | 1-Decene, \text{C}_{10}\text{H}_{20} | 0 | 0.171 | 0 | 0 |
| 8.457              | Undecene, \text{C}_{11}\text{H}_{22} | 4.451 | 0 | 0 | 0 |
| 8.587              | Undecane, \text{C}_{11}\text{H}_{24} | 0.144 | 0 | 0 | 0 |
| 8.611              | Indene | 0 | 0.681 | 0.308 | 0 |
| 9.493              | 3-Methyindene, | 0.641 | 0 | 0.908 | 0 |
|   | Compound                        | CAS# | n | C  | H  | O  | N  |
|---|---------------------------------|------|---|----|----|----|----|
| 9.937 | Decadiene, C_{10}H_{18} |      |   |    |    |    |    |
| 10.094 | Naphthalene, C_{10}H_{16} | 3.607 | 16.763 | 17.6 | 0 |
| 11.430 | Tridecadiene, C_{13}H_{24} | 1.377 | 0.045 | 0.056 | 0 |
| 11.539 | 1-Tridecene, C_{13}H_{26} | 2.493 | 0.271 | 0.473 | 0.252 |
| 11.653 | Tridecene, C_{13}H_{28} | 1.169 | 0.114 | 0.212 | 0.146 |
| 11.731 | 2-Methyl-naphthalene, C_{10}H_{14} | 4.635 | 6.403 | 9.776 | 1.867 |
| 11.87 | 1-Tetradecene, C_{14}H_{28} | 4.284 | 0 | 0 | 0 |
| 12.898 | Biphenyl, C_{12}H_{10} |      | 7.246 | 10 | 0 |
| 12.922 | 3-Cyclohexen-1-yl-benzene |      | 0.24 | 0 | 0 | 9.449 |
| 13.011 | Tetradecane, C_{14}H_{30} | 1.543 | 0 | 0.445 | 0 |
| 13.438 | 1,7-Dimethylnaphthalene, C_{12}H_{12} | 0.719 | 1.99 | 2.432 | 0.834 |
| 13.586 | Biphenylmethane, C_{12}H_{12} | 0.535 | 0 | 0.839 | 0.933 |
| 13.819 | 1-Hexadecene, C_{16}H_{32} | 3.222 | 0 | 0.541 | 0 |
| 14.187 | 1-Pentadecene, C_{15}H_{30} | 2.566 | 0.445 | 0.538 | 0 |
| 14.257 | 3-methyl-1,1'-Biphenyl, C_{14}H_{14} | 0.205 | 0.686 | 2.499 | 4.852 |
| 14.265 | 4-methyl-1,1'-Biphenyl, C_{14}H_{14} |      | 0 | 2.234 | 1.445 | 0 |
| 14.283 | 10-Methyl-eicosane, C_{20}H_{44} | 1.448 | 0 | 0 | 0 |
| 14.829 | 2,6,10-trimethyl-Tetradecane, C_{17}H_{36} | 1.584 | 0.847 | 0.416 | 0.217 |
| 14.977 | 1-Heptadecene, C_{17}H_{34} | 3.08 | 0.575 | 0.576 | 0.897 |
| 15.310 | 1,9-Tetradecadiene, C_{14}H_{26} | 0.55 | 0 | 0 | 0 |
| 15.345 | 2-Ethyl-1,1'-Biphenyl, C_{14}H_{14} | 0 | 0.263 | 0.28 | 1.236 |
| 15.476 | Hexadecane, C_{16}H_{34} | 1.738 | 0.417 | 0 | 0.194 |
| 15.510 | Fluorene, C_{18}H_{12} | 0.801 | 1.447 | 3.092 | 4.24 |
| 16.074 | 1-Octadecene, C_{18}H_{36} | 0 | 0.433 | 0 | 0.413 |
| 16.268 | 7-phenyl-Bicyclo[4.2.1]nona-2,4,7- | 2.592 | 0.622 | 0.239 | 0 |
| Compound | Formula | Triene | Octadecane, C_{18}H_{38} | Anthracene, 9,10-dihydro-9,10-dimethyl-Anthracene, | 1-Nonadecene, C_{19}H_{38} | Nonadecene, C_{19}H_{40} | 1,3-Diphenyl-3-methylcyclopropene, | 1-Eicosene, C_{20}H_{40} | 2-Phenynaphthalene, | 1-Docosene, C_{22}H_{44} |
|----------|---------|--------|--------------------------|----------------------------------------|---------------------------------|-------------------------------|---------------------------------|--------------------------|----------------------------|---------------------------|
| 16.817   |         | 0      | 1.473                    | 1.764                                  | 1.236                            |                               |                                 |                          |                           |                          |
| 17.688   |         |        | 1.211                    | 0.47                                   | 0.31                             | 0                             |                                 |                          |                           |                          |
| 17.766   |         |        | 1.759                    | 4.665                                  | 7.034                            | 15.721                        |                                 |                          |                           |                          |
| 17.879   |         |        | 0.831                    | 1.272                                  | 0                                | 0                             |                                 |                          |                           |                          |
| 18.533   |         | 0.949  | 2.268                    | 2.236                                  | 4.41                            |                               |                                 |                          |                           |                          |
| 18.611   |         | 1.492  | 0                        | 0.901                                  | 0.928                           |                               |                                 |                          |                           |                          |
| 18.646   |         | 5.428  | 2.341                    | 1.203                                  | 0                               |                               |                                 |                          |                           |                          |
| 18.707   |         | 1.415  | 0                        | 0.197                                  | 0.197                           |                               |                                 |                          |                           |                          |
| 18.950   |         | 0.928  | 0                        | 0                                      | 0                               |                               |                                 |                          |                           |                          |
| 18.959   |         |        | 0                        | 0.932                                  | 0.94                            | 0.475                         |                                 |                          |                           |                          |
| 19.203   |         | 0.458  | 0.731                    | 0.582                                  | 0.91                            |                               |                                 |                          |                           |                          |
| 19.630   |         | 1.422  | 0.609                    | 0.352                                  | 0                               |                               |                                 |                          |                           |                          |
| 19.691   |         | 4.139  | 5.506                    | 5.794                                  | 15.884                          |                               |                                 |                          |                           |                          |
| 19.874   |         | 1.081  | 0.495                    | 1.383                                  | 0.648                           |                               |                                 |                          |                           |                          |
| 20.57    |         | 3.365  | 1.315                    | 0.507                                  | 0                               |                               |                                 |                          |                           |                          |
| Time (s) | Component | Formula     | Mass (amu) | Charge 1 | Charge 2 | Charge 3 | Charge 4 |
|---------|-----------|-------------|------------|----------|----------|----------|----------|
| 20.588  | Fluoranthene | C_{16}H_{10} | 209.14     | 0        | 0        | 1.365    | 0        |
| 20.614  | Tricosane, C_{23}H_{48} | 314.17 | 0.5562     | 0        | 0        | 0.822    | 0        |
| 20.657  | Hexacosene, C_{26}H_{52} | 414.31 | 0.667      | 0.381    | 0        | 0        | 0        |
| 20.794  |          |            |            | 0        | 1.026    | 0.933    | 1.483    |
| 21.284  |          |            |            | 0.313    | 0.631    | 0.151    | 0.49     |
| 21.311  |          |            |            | 0        | 0        | 0.705    | 0        |
| 21.511  | Octacosane, C_{28}H_{56} | 514.45 | 1.401      | 0        | 0        | 3.317    | 0        |
| 21.964  |          |            |            | 0        | 0        | 1.531    | 1.967    |
| 21.972  |          |            |            | 0.419    | 0        | 0.436    | 1.276    |
| 22.376  | Heptacosane, C_{27}H_{56} | 614.59 | 13.321     | 4.725    | 4.697    | 0        | 0        |
| 22.329  | Tricosene, C_{23}H_{46} | 318.27 | 1.773      | 0.451    | 0.538    | 0        | 0        |
| 23.157  | C_{24}H_{49}OH |          |            | 1.997    | 0        | 0        | 0        |
| 23.621  | Pyrene, C_{16}H_{10} | 209.14 | 0.752      | 1.103    | 2.839    | 6.442    | 0        |
| 23.949  | Pentacosene, C_{25}H_{50} | 418.67 | 1.379      | 0        | 0        | 6.346    | 0        |
| 24.080  | Benzanthracene, C_{22}H_{16} | 318.27 | 0          | 0        | 2.953    | 0        | 0        |
| 24.716  | 1-Heptacosene, C_{27}H_{54} | 418.67 | 1.417      | 0        | 0        | 0        | 0        |
| 26.370  | C_{35}H_{70} |          | 580.57     | 5.367    | 2.835    | 3.742    | 0        |
| 27.372  | C_{44}H_{90} |          |            | 2.839    | 0.408    | 0        | 0.809    |
| 27.381  | Benzofluoranthe, C_{26}H_{49} | 422.35 | 0          | 0.262    | 1.921    | 0        | 0        |
| 27.413  |          |            |            | 0        | 0        | 0        | 15.447   |
1,3,5-Triphenylbenzene,