

Production of Lignin-Derived Functional Material for Efficient Electromagnetic Wave Absorption with an Ultralow Filler Ratio

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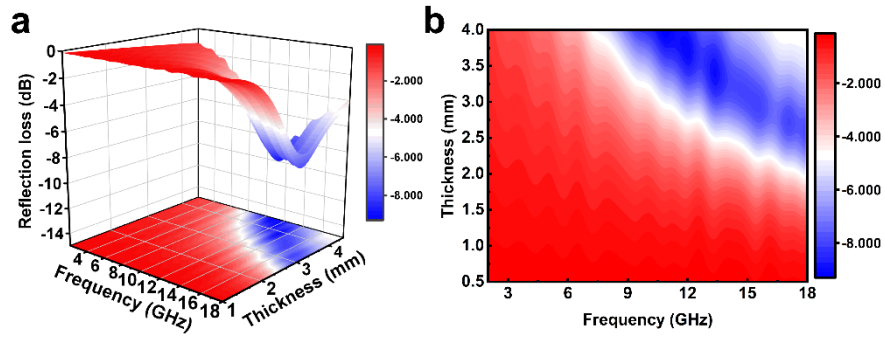


Figure S1. Three-dimensional reflection loss representations and two-dimensional reflection loss projection mappings of LC.

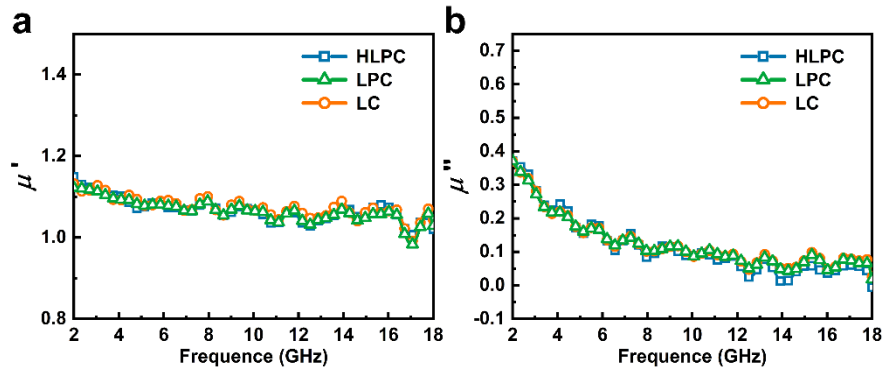


Figure S2. (a) Real part and (b) imaginary part of permeability for LC, LPC and HLPC.

Table S1 Purity, molecular weight, and functional group information of LS

| Sample | Purity (%) | M _w (g/mol) | Phenolic OH (mmol/g) | Carboxy (mmol/g) | Sulfonic group (mmol/g) |
|--------|------------|------------------------|----------------------|------------------|-------------------------|
| LS | 95.1 | 19400 | 1.87 | 1.52 | 1.57 |

Table S2 Elements content of samples determined by XPS.

| Sample | Element content (%) | | | |
|--------|---------------------|------|------|------|
| | C | O | N | S |
| LC | 88.80 | 8.57 | 1.07 | 1.56 |
| LPC | 91.15 | 7.78 | 0.73 | 0.34 |
| HLPC | 92.28 | 6.78 | 0.57 | 0.37 |

Table S3 Functional groups content of samples determined by XPS.

| Sample | C 1s content (%) | | | | |
|--------|------------------|-------|------|------|-------|
| | C=C | C-C | C-O | C=O | COOH |
| LC | 59.11 | 16.33 | 6.17 | 8.03 | 10.36 |
| LPC | 64.68 | 8.31 | 6.43 | 5.66 | 14.92 |
| HLPC | 64.90 | 10.84 | 6.60 | 5.00 | 12.66 |