

Supporting information

## UV-curable ladder-like diphenylsiloxane-bridged methacryl-phenyl-siloxane for high power LED encapsulation

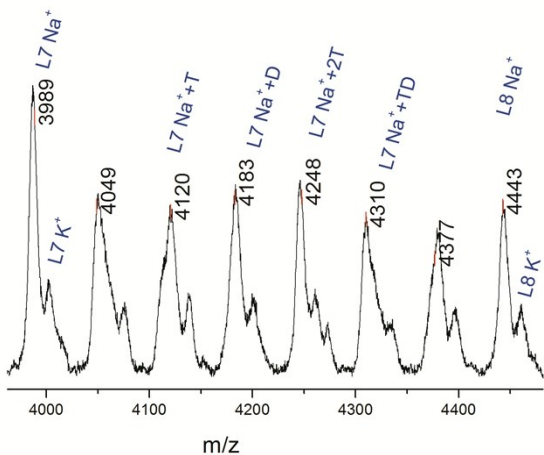
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**Table S1.** The theoretical data m/z for L-MPS with different repeat unit (n) and those found in MALDI-TOF MS perfectly match theoretical ones

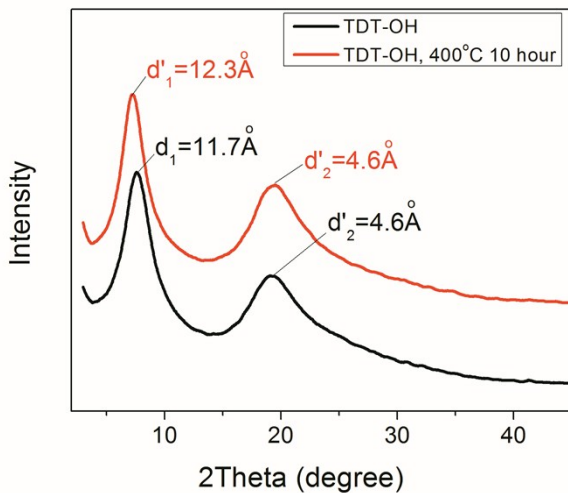
| n  | Theoretical data <sup>†</sup> (m/z) |                                    | Found in MALDI-TOF MS (m/z)    |
|----|-------------------------------------|------------------------------------|--------------------------------|
|    | L-MPS                               | L-MPS complex with Na <sup>+</sup> | the marked peaks in the graph. |
| 1  | 1228.5                              | 1250.5                             | --                             |
| 2  | 1684.6                              | 1706.6                             | --                             |
| 3  | 2140.7                              | 2162.7                             | --                             |
| 4  | 2596.8                              | 2618.8                             | --                             |
| 5  | 3052.9                              | 3074.9                             | --                             |
| 6  | 3509.0                              | 3531.0                             | 3531                           |
| 7  | 3965.1                              | 3987.1                             | 3987                           |
| 8  | 4421.2                              | 4443.2                             | 4443                           |
| 9  | 4877.3                              | 4899.3                             | 4899                           |
| 10 | 5333.4                              | 5355.4                             | 5355                           |
| 11 | 5789.5                              | 5811.5                             | 5812                           |

<sup>†</sup> The theoretical data were obtained from ChemDraw Ultra 10.0 by put in the formula of the molecules.



**Figure S1.** The enlarged MALDI-TOF MS spectrum between L-MPS of n=7 (L7) and n=8 (L8).

The enlarged MALDI-TOF MS spectrum between L-MPS of n=7 (L7) and n=8 (L8) shows that the peaks between L7 and L8 are mainly correspond to the proposed ladder structure with an additional T, D, TT or TD group. At this stage, it is hard to define how the additional groups attach to the main chain, but the combination of the characterization results, including those from XRD and TEM, support the ladder-like structure of L-MPS.



**Figure S2.** The XRD curves of the TDT-OH before and after treated at 400°C for 10 hours.

The XRD measurement shows that after 400°C for 10 hours, the peaks represent the ladder structure kept almost unchanged.

**Table S2.** The comparison of anti- Sulfidation of L-MPS-B with OE-7662.

| sample  | Item           | before        |             | after         |             | $\Delta$ LEE(%) | $\Delta$ Tc (%) |
|---------|----------------|---------------|-------------|---------------|-------------|-----------------|-----------------|
|         |                | LEE (lm/W)    | Tc(K)       | LEE (lm/W)    | Tc(K)       |                 |                 |
| Ladder  | 1              | 174.39        | 7332        | 174.93        | 7238        | 0.31            | -1.28           |
|         | 2              | 174.99        | 7334        | 175.29        | 7377        | 0.17            | 0.59            |
|         | 3              | 169.27        | 7578        | 169.36        | 7564        | 0.05            | -0.18           |
|         | 4              | 174.47        | 7771        | 173.64        | 7748        | -0.48           | -0.30           |
|         | 5              | 169.75        | 7700        | 168.7         | 7652        | -0.62           | -0.62           |
|         | 6              | 172.95        | 7881        | 171.91        | 8030        | -0.60           | 1.89            |
|         | <b>Average</b> | <b>172.64</b> | <b>7599</b> | <b>172.31</b> | <b>7601</b> | <b>-0.19</b>    | <b>0.02</b>     |
|         | STDEV          | 2.52          | 229         | 2.81          | 280         | 0.42            | 1.10            |
| OE-7662 | 1              | 172.93        | 8093        | 169.22        | 8280        | -2.15           | 2.31            |
|         | 2              | 175.7         | 7910        | 170.47        | 8082        | -2.98           | 2.17            |
|         | 3              | 169.5         | 7985        | 166.06        | 8098        | -2.03           | 1.42            |
|         | 4              | 176.11        | 7852        | 172.6         | 7892        | -1.99           | 0.51            |
|         | 5              | 169.34        | 8140        | 165.93        | 8307        | -2.01           | 2.05            |
|         | 6              | 169.04        | 8206        | 166.62        | 8113        | -1.43           | -1.13           |
|         | <b>Average</b> | <b>172.10</b> | <b>8031</b> | <b>168.48</b> | <b>8128</b> | <b>-2.10</b>    | <b>1.22</b>     |
|         | STDEV          | 3.27          | 138         | 2.73          | 151         | 0.50            | 1.33            |