Hybrid Sol-Gel Double Metal Cyanide Catalysts for the
Copolymerisation of Styrene oxide and CO₂

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Supplementary data
For evaluating the efficiency of the catalysts in polymerisation (Eq. 1), 1H NMR spectra were recorded of the crude reaction mixtures in CDCl₃. The signals were assigned as listed in Table 1. The relative intensity of the signals was obtained by integration, whereby the intensity of the phenyl signals was set to five.

\[
\text{(m+n+o) } \text{SO₂Ph} + \text{(m+n+o) } \text{CO₂} \xrightarrow{\text{Catalyst}} \text{Bu₃N} \left[ \begin{array}{c} \text{O} \\ \text{O} \\ \text{A₁} \\ \text{B₁} \\ \text{B₂} \\ \text{OH} \end{array} \right] _{m-n} + \text{BuOH}
\]

Eq. 1
Table 1: Assignment of the signals in the $^1$H NMR spectra obtained for the reaction mixtures of the copolymerisation of styrene oxide and CO$_2$.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Proton</th>
<th>Chemical shift [ppm]</th>
<th>Number of protons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene carbonate</td>
<td>C1</td>
<td>4.80 and 4.28</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>5.68</td>
<td>1</td>
</tr>
<tr>
<td>Polycarbonate</td>
<td>A1</td>
<td>4.99</td>
<td>2</td>
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<tr>
<td></td>
<td>A2</td>
<td>5.77</td>
<td>1</td>
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<tr>
<td>Polyether</td>
<td>B1</td>
<td>3.80</td>
<td>2</td>
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<tr>
<td></td>
<td>B2</td>
<td>4.26</td>
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<tr>
<td>Phenyl groups</td>
<td>Ph</td>
<td>7.25-7.34</td>
<td>5</td>
</tr>
<tr>
<td>Styrene oxide</td>
<td>SO1</td>
<td>2.81 and 3.15</td>
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<tr>
<td></td>
<td>SO2</td>
<td>3.87</td>
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<td>Type A</td>
<td>Type B</td>
</tr>
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<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diameter [nm] or Thickness [nm×nm]</td>
<td>Diameter [nm×nm]</td>
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<td>S1</td>
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<td>301</td>
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<td>22</td>
<td>S2</td>
<td>255</td>
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Platelets selected for the statistical analysis were oriented either perpendicular or parallel to the viewing plane, so that either the horizontal extent (diameter) or the thickness of the particle were observed, respectively.