Macroporous poly(Dicyclopentadiene) $\gamma$Fe$_2$O$_3$/Fe$_3$O$_4$ Nanocomposite Foams by High Internal Phase Emulsion Templating

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Electronic Supporting Material (ESI)
Emulsion stability

Fig. S1 Binary mixture of DCPD (20 v%) and water (80 v% @ 80°C)

Fig. S2 Ternary and quaternary mixtures of DCPD (20 v%) and water (80 v% @ 80°C)

Fig. S3 Ternary and quaternary mixtures of DCPD (20 v%) and water (80 v% @ 80°C)
Curing of the HIPE

Fig. S4 Macroscopically observed pores in pDCPD-xw

Fig. S5 Photograph showing the quality of moulded parts; ideal shape of the mould is only obtained in case of pDCPD-5w-10v
Elemental Analyses

Elemental analysis of pDCPD-10v
freshly prepared: Calcd: C, 90.85; H, 9.15; found: C, 89.65; H 8.98.
and aged (stored for 1 month under air) found: C, 63.0; H, 6.0.

Elemental analysis of pDCPD-1w-10v
freshly prepared: Calcd: C, 90.0; H, 9.1; found: C, 88.9, H, 8.7.
and aged (stored for 1 month under air): Calcd: 63.2; found: H, 5.9.

Accordingly aged samples gain weight upon oxidation by the factor of approx. 1.4. As in the TGA measurements aged samples were used obtained residual masses have to be corrected accordingly in order to estimate the Fe-NP content in the not aged sample. A residual mass of 22.3% (as determined for pDCPD-30w-10v) means 31.2% Fe-NP in the original sample.

<table>
<thead>
<tr>
<th>Determined residual mass</th>
<th>residual mass in respect to unoxidized pDCPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDCPD-30w-10v</td>
<td>22.3%</td>
</tr>
<tr>
<td>pDCPD-20w-10v</td>
<td>15.6%</td>
</tr>
<tr>
<td>pDCPD-15w-10v</td>
<td>13.2%</td>
</tr>
<tr>
<td>pDCPD-10w-10v</td>
<td>10.1%</td>
</tr>
<tr>
<td>pDCPD-5w-10v</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Porosity

Table S2 Results of the porosity measurements

<table>
<thead>
<tr>
<th>1.5 v% surfactant</th>
<th>pDCPD-1w-1.5v</th>
<th>pDCPD-5w-1.5v</th>
<th>pDCPD-10w-1.5v</th>
<th>pDCPD-15w-1.5v</th>
<th>pDCPD-20w-1.5v</th>
</tr>
</thead>
<tbody>
<tr>
<td>79%</td>
<td>82%</td>
<td>73%</td>
<td>75%</td>
<td>77%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10 v% surfactant</th>
<th>pDCPD-1w-10v</th>
<th>pDCPD-5w-10v</th>
<th>pDCPD-10w-10v</th>
<th>pDCPD-15w-10v</th>
<th>pDCPD-20w-10v</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>74%</td>
<td>72%</td>
<td>73.5%</td>
<td>66%</td>
<td></td>
</tr>
</tbody>
</table>

b Additional Hg-porosimetry was done as a cross-check test for sample DCPD-15w-10v where a porosity of 73% was found.
Fig. S6 SEM-pictures of the nanocomposite foams prepared with 1.5 v% surfactant
Fig. S7 SEM-pictures of the nanocomposite foams prepared with 10 v% surfactant
**Fig. S8** Pore size distributions of poly(DCPD)-nanocomposite-HIPEs from the corresponding SEM micrographs.

**Fig. S9** EFTEM image of pDCPD-15w-1.5v and EDX images (top: EDX2a; middle: EDX2b and below: EDX2c).
Fig. S10 TEM and AFM pictures of pDCPD-15w
Fig. S11 AFM and SEM pictures of pDCPD-15w-1.5v
Magnetic Properties

Fig. S12 Inductive heating of pDCPD-15w-1.5v (above) and magnetization of pDCPD-15w-1.5v (below)
Fig. S13 X-ray powder diffraction pattern (CuKα, measured on Bruker D8 Advance) of the sample pDCPD-30w-10v upon burning @ 550°C in pure oxygen corresponding to α-Fe₂O₃.