Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

Macroporous poly(Dicyclopentadiene) γFe_2O_3/Fe_3O_4 Nanocomposite Foams by High Internal Phase Emulsion Templating

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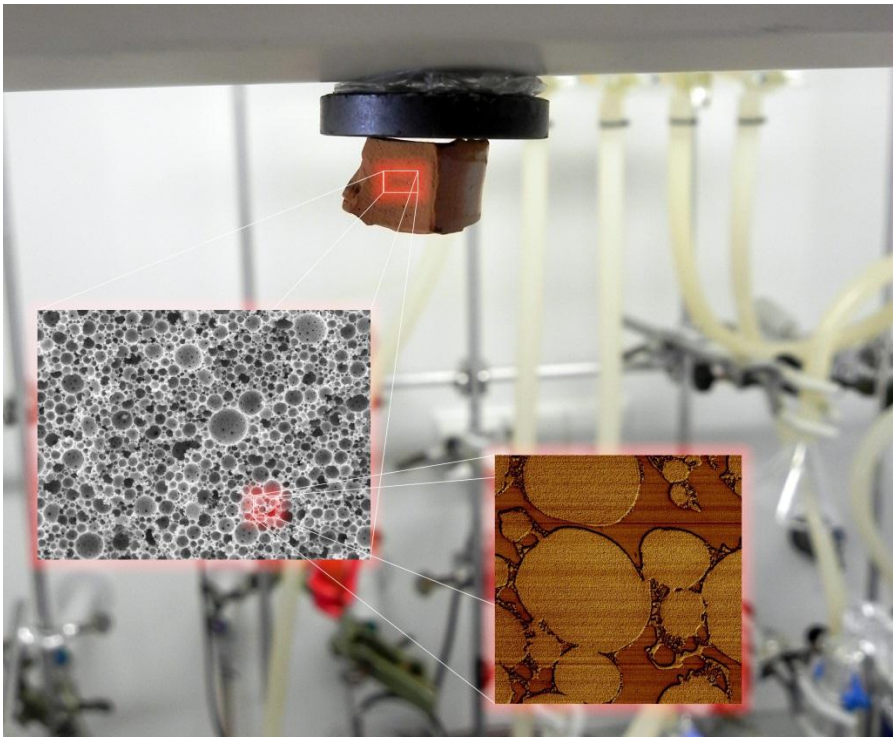
Electronic Supporting Material (ESI)



Emulsion stability

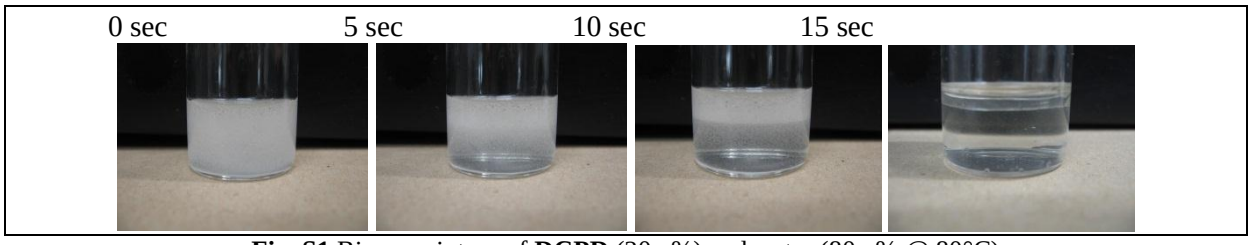


Fig. S1 Binary mixture of **DCPD** (20 v%) and water (80 v% @ 80°C)

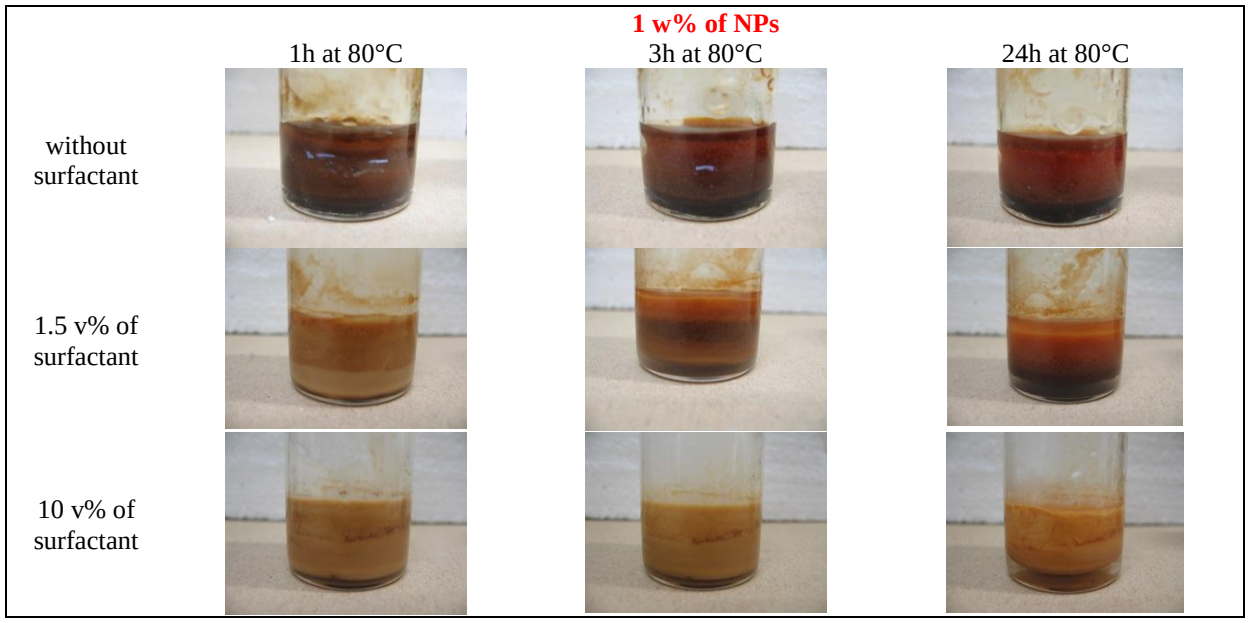


Fig. S2 Ternary and quarnary mixtures of **DCPD** (20 v%) and water (80 v% @ 80°C)

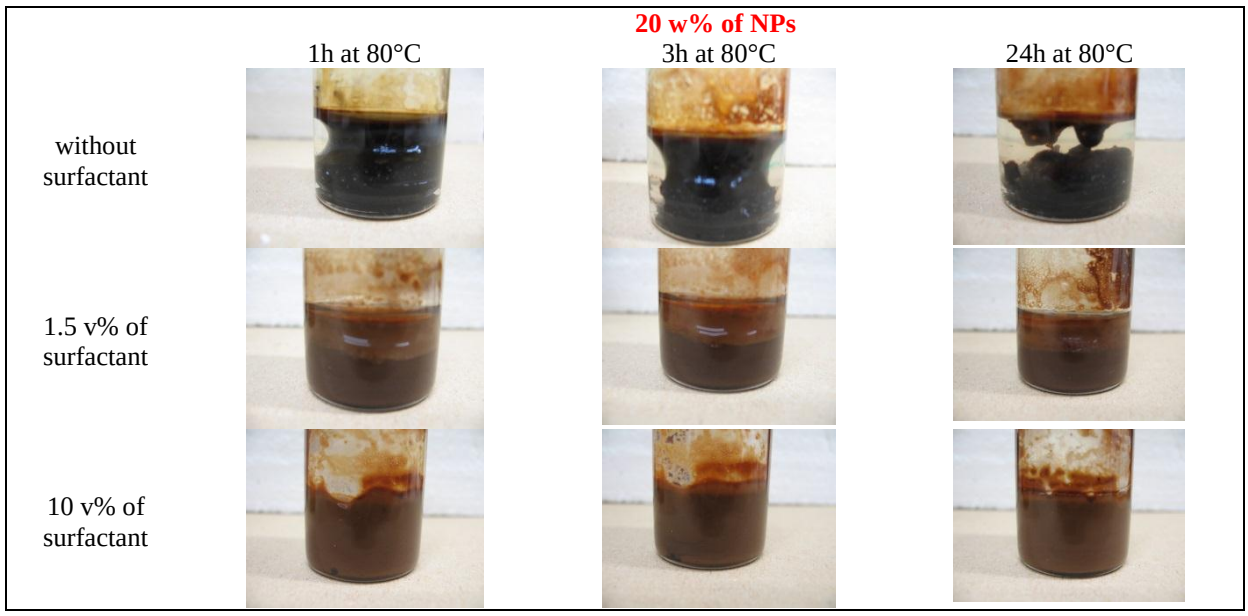


Fig. S3 Ternary and quarnary mixtures of **DCPD** (20 v%) and water (80 v% @ 80°C)

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.

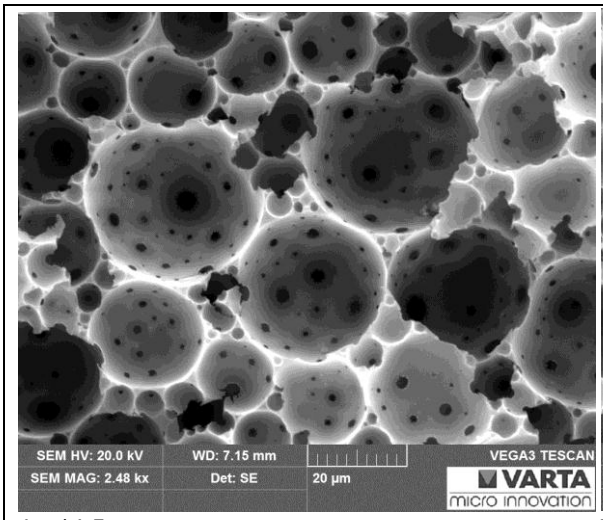
	Determined residual mass	**residual mass in respect to unoxidized pDCPD**
pDCPD-30w-10v	22.3%	31.2%
pDCPD-20w-10v	15.6%	21.8%
pDCPD-15w-10v	13.2%	18.5%
pDCPD-10w-10v	10.1%	14.1%
pDCPD-5w-10v	5.5%	7.7%

Porosity

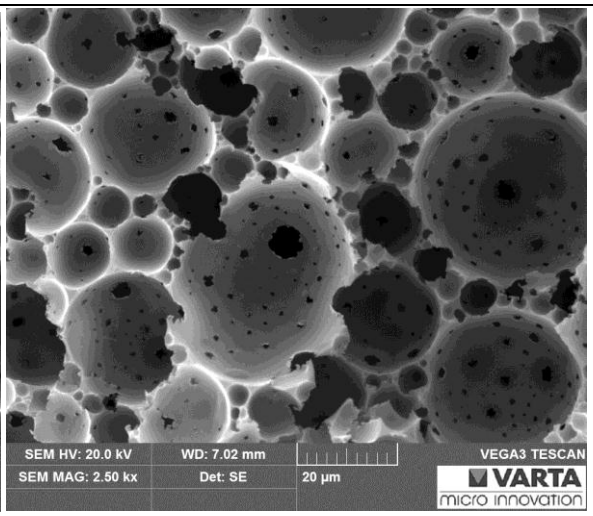
Table S2 Results of the porosity measurements

1.5 v% surfactant				
pDCPD-1w-1.5v	**pDCPD-5w-1.5v**	**pDCPD-10w-1.5v**	**pDCPD-15w-1.5v**	**pDCPD-20w-1.5v**
79%	82%	73%	75%	77%
10 v% surfactant				
pDCPD-1w-10v	**pDCPD-5w-10v**	**pDCPD-10w-10v**	**pDCPD-15w-10v**	**pDCPD-20w-10v**
70%	74%	72%	73.5% [b]	66%

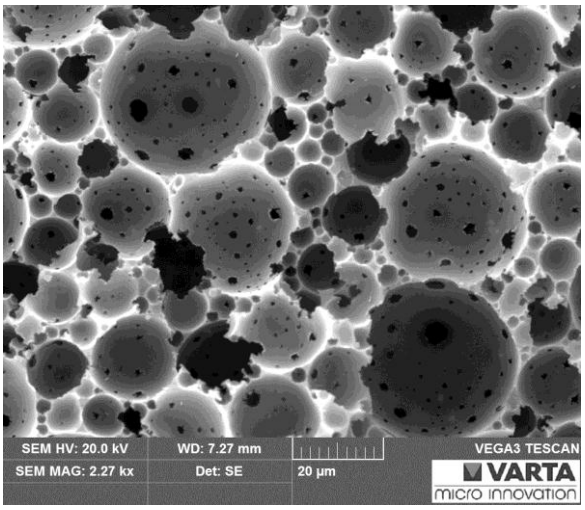
[a] Assessed according to N. H. Idris, M. M. Rahman, J.-Z. Wang and H.-K. Liu, *J. Power Sources*, 2012, **201**, 294.
[b] Additional Hg-porosimetry was done as a cross-check test for sample **DCPD-15w-10v** where a porosity of 73% was found



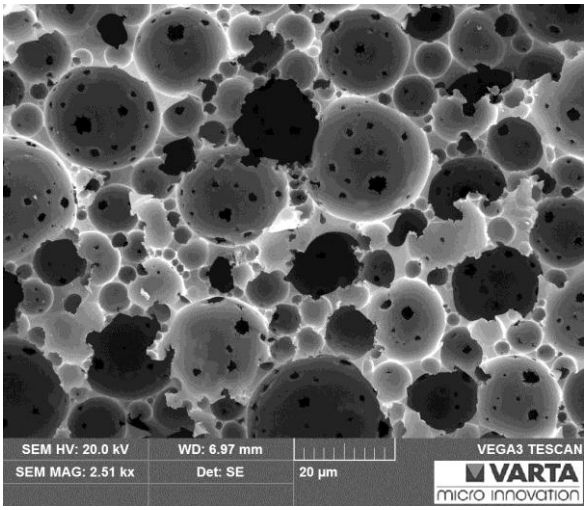
1w / 1.5v



5w / 1.5v



10w / 1.5v



15w / 1.5v

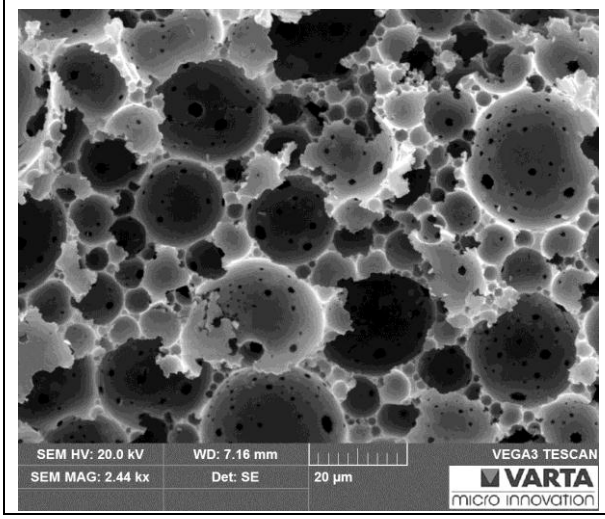
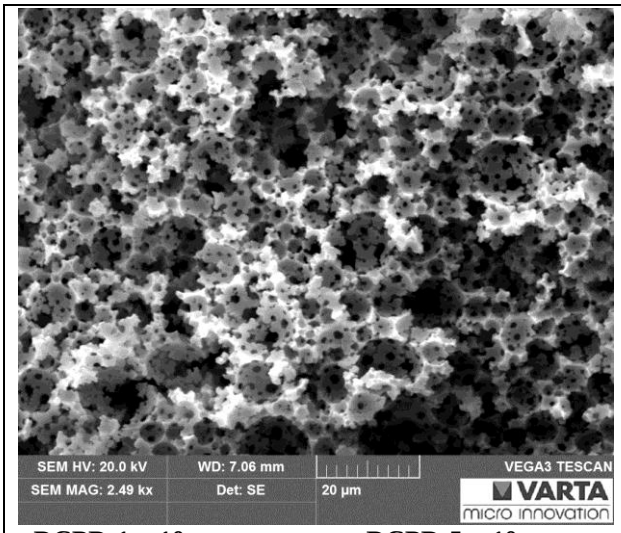
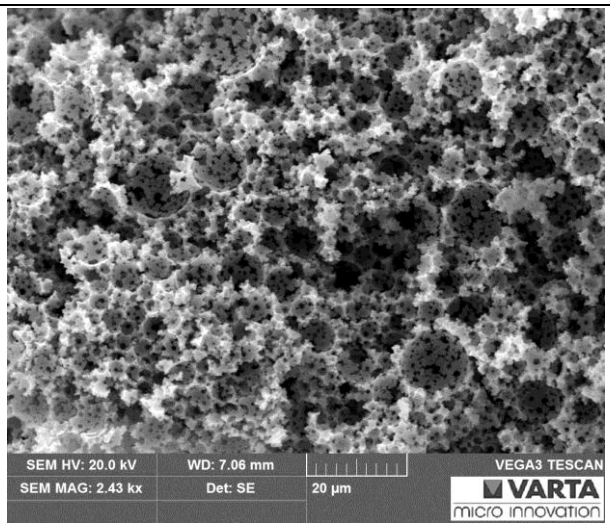


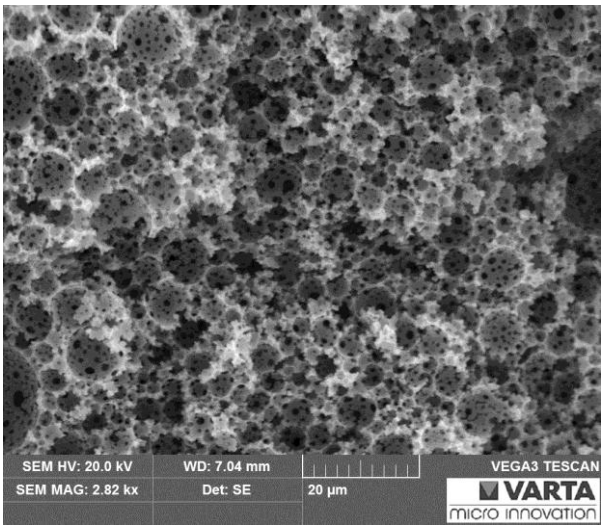
Fig. S6 SEM-pictures of the nanocomposite foams prepared with 1.5 v% surfactant



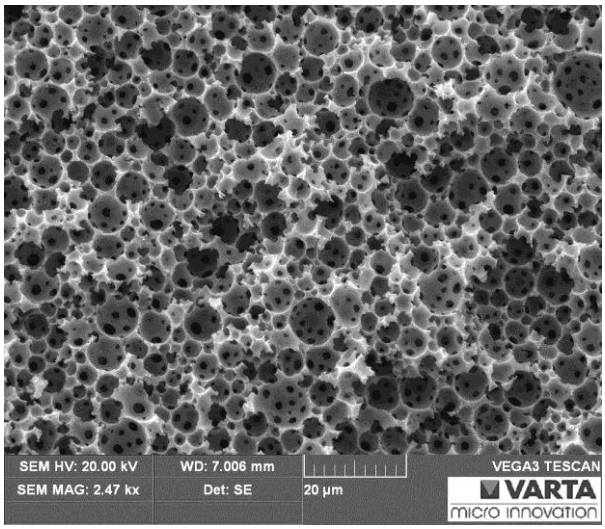
pDCPD-1w-10v



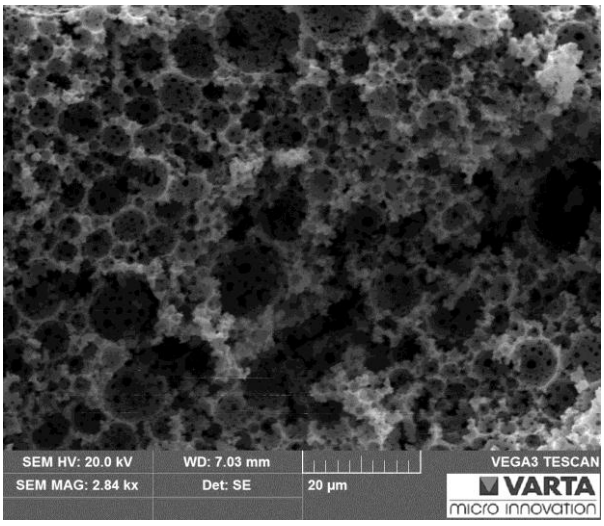
pDCPD-5w-10v



pDCPD-10w-10v



pDCPD-15w-10v



pDCPD-20w-10v

Fig. S7 SEM-pictures of the nanocomposite foams prepared with 10 v% surfactant

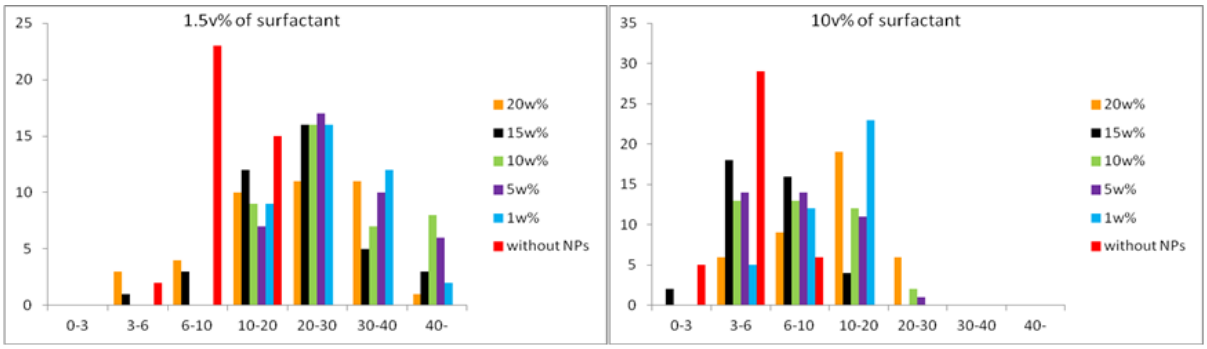


Fig. S8 Pore size distributions of poly(DCPD)-nanocomposite-HIPEs from the corresponding SEM micrographs

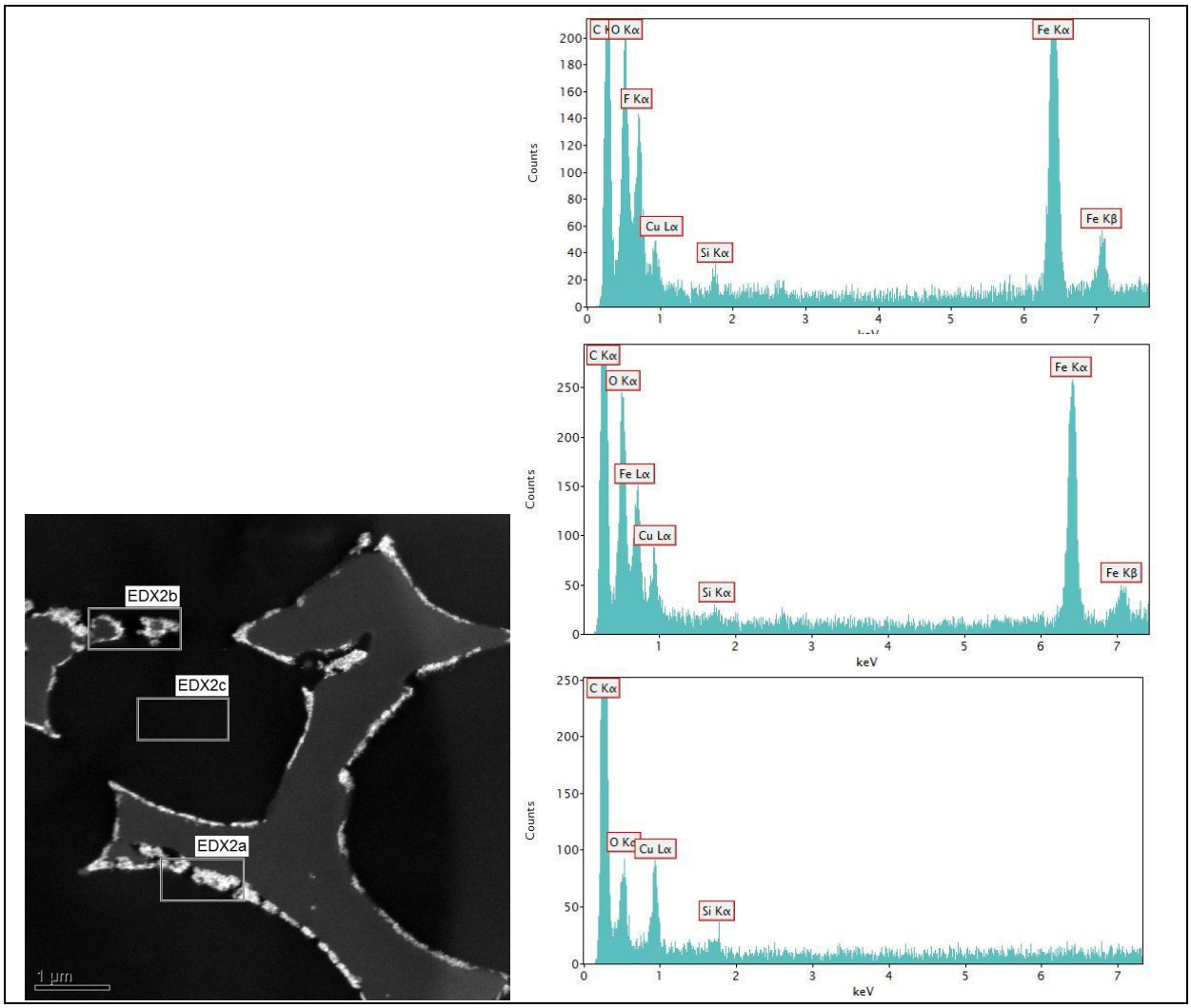


Fig. S9 EFTEM image of **pDCPD-15w-1.5v** and EDX images (top: EDX2a; middle: EDX2b and below: EDX2c)

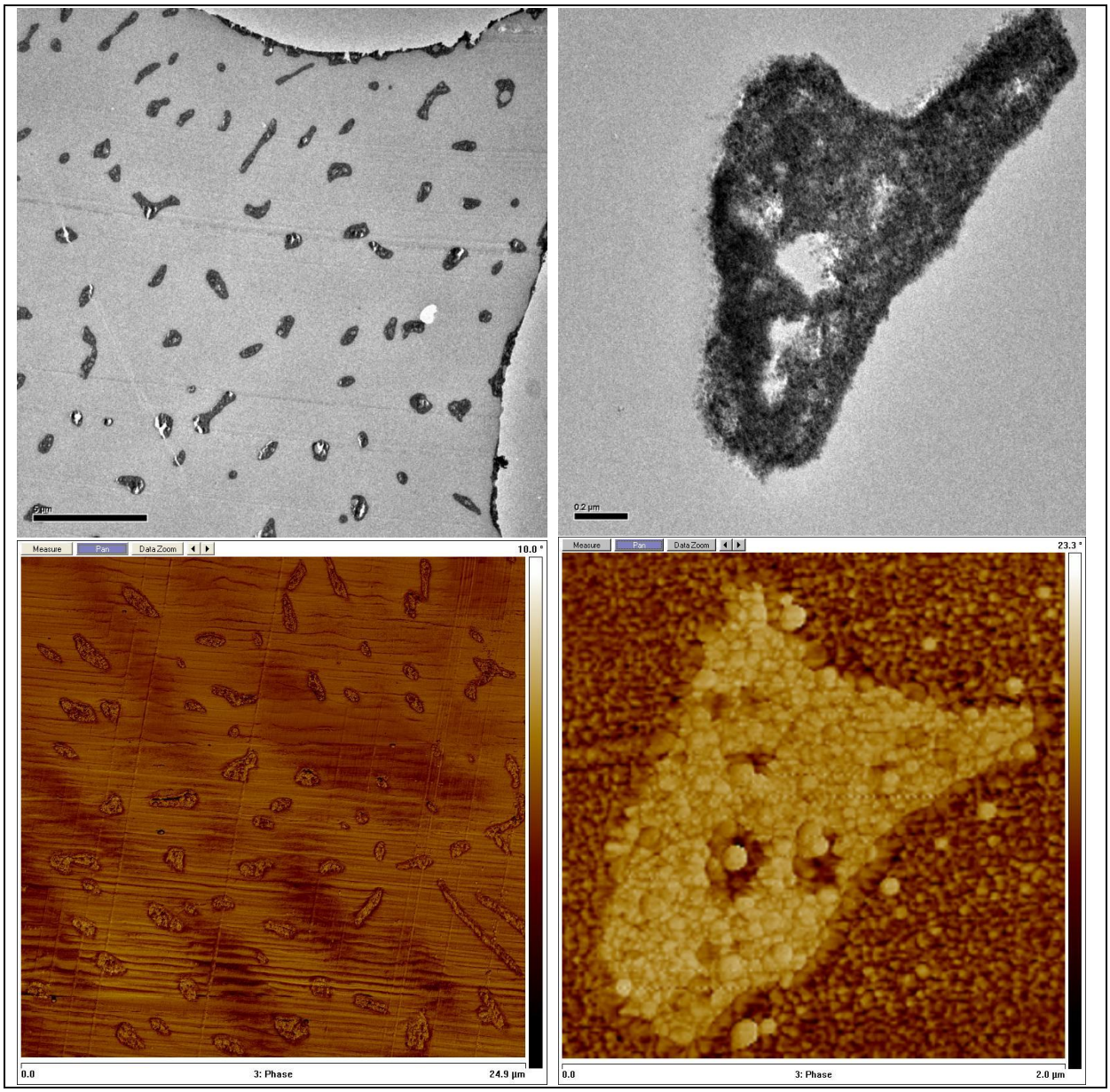


Fig. S10 TEM and AFM pictures of **pDCPD-15w**

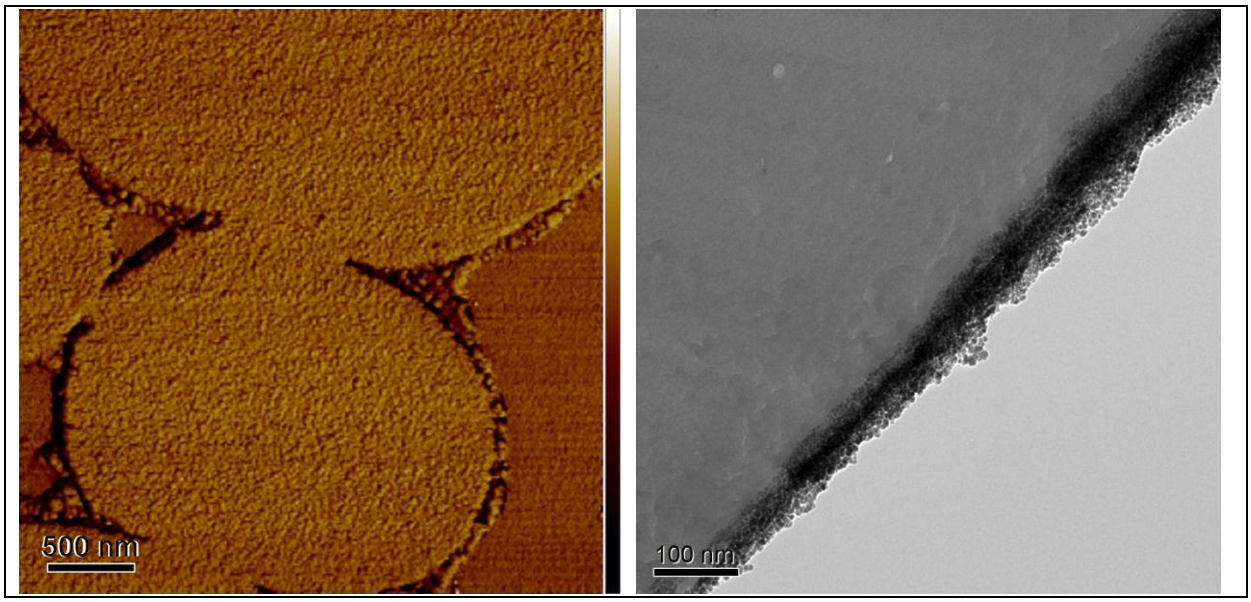


Fig. S11 AFM and SEM pictures of **pDCPD-15w-1.5v**

Magnetic Properties

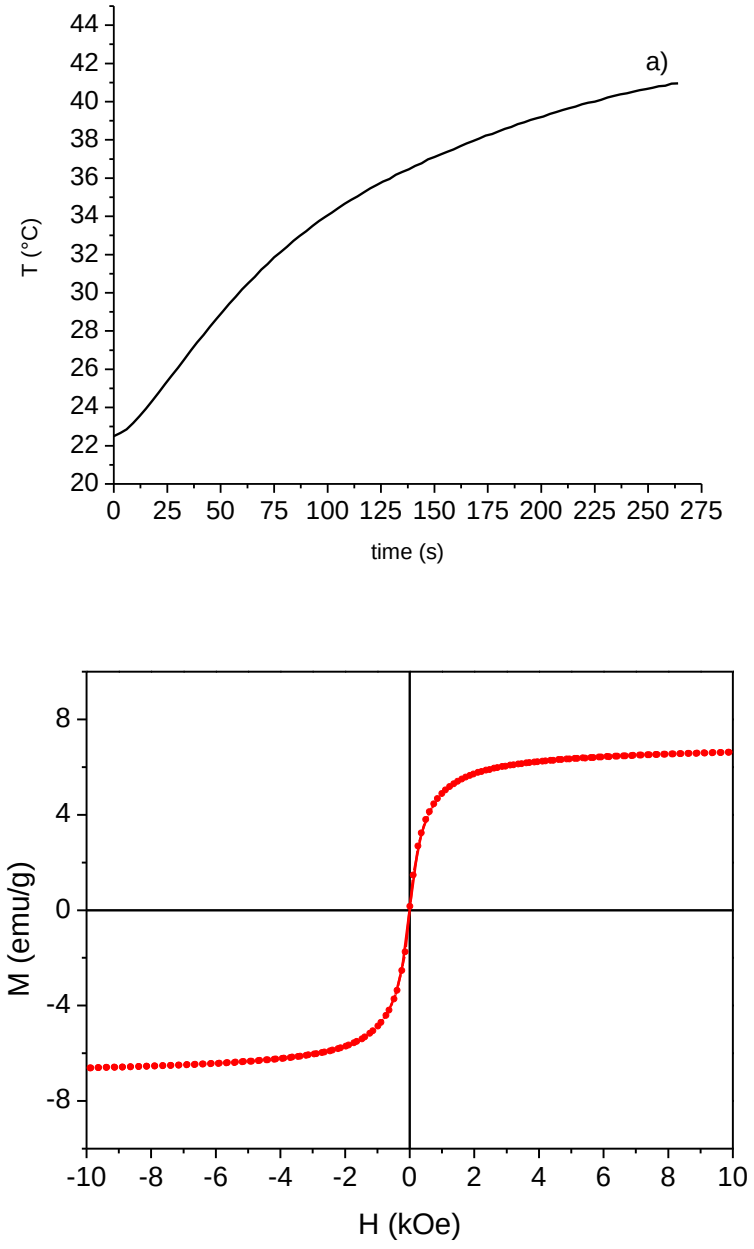


Fig. S12 Inductive heating of **pDCPD-15w-1.5v** (above) and magnetization of **pDCPD-15w-1.5v** (below)

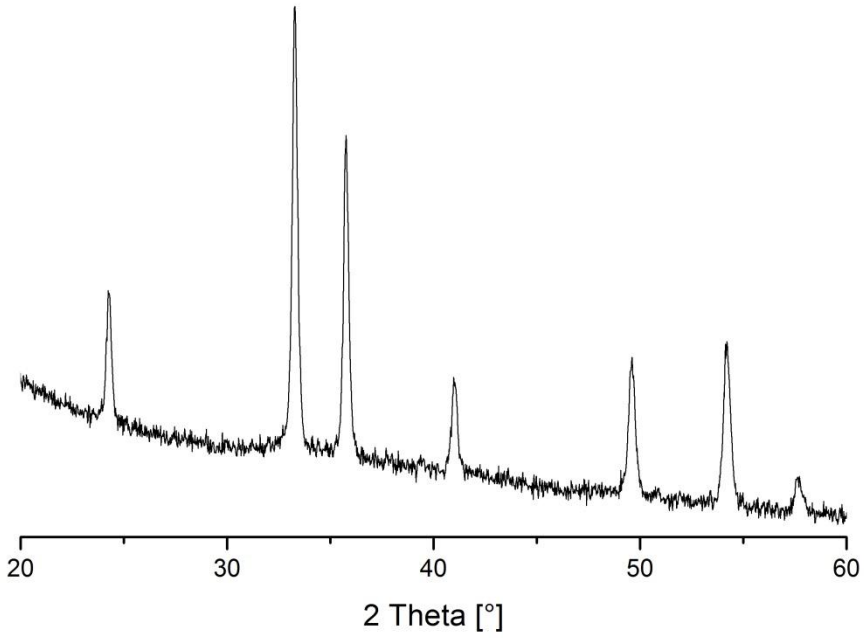


Fig. S13 X-ray powder diffraction pattern (CuKα, measured on Bruker D8 Advance) of the sample **pDCPD-30w-10v** upon burning @ 550°C in pure oxygen corresponding to α-Fe_2O_3