Electronic Supplementary Material (ESI) for RSC Advances

Biomimetic Crystallization of Anisotropic Zinc Oxide Nanoparticles in the Homogeneous Phase: Shape Control by Surface Additives Applied under Thermodynamic or Kinetic Control

*Carlos Lizandara-Pueyo, Maria Carmen Morant-Miñana, Martin Wessig, Michael Krumm, Stefan Mecking and Sebastian Polarz**

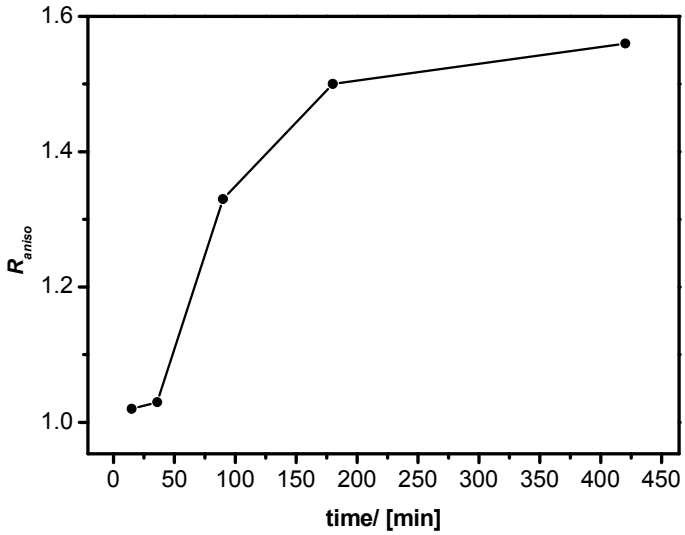
University of Konstanz, Department of Chemistry, 78457 Konstanz, Germany.

SUPPORTING INFORMATION

Electronic Supplementary Material (ESI) for RSC Advances

SI-1

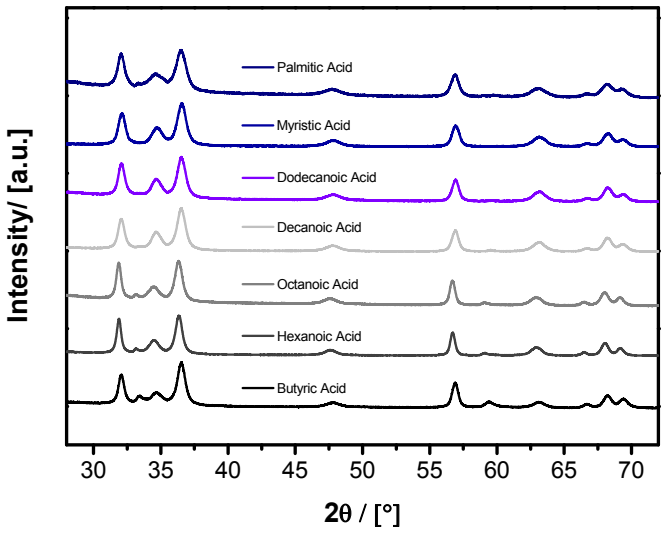
Temporal evolution of the anisotropy grade



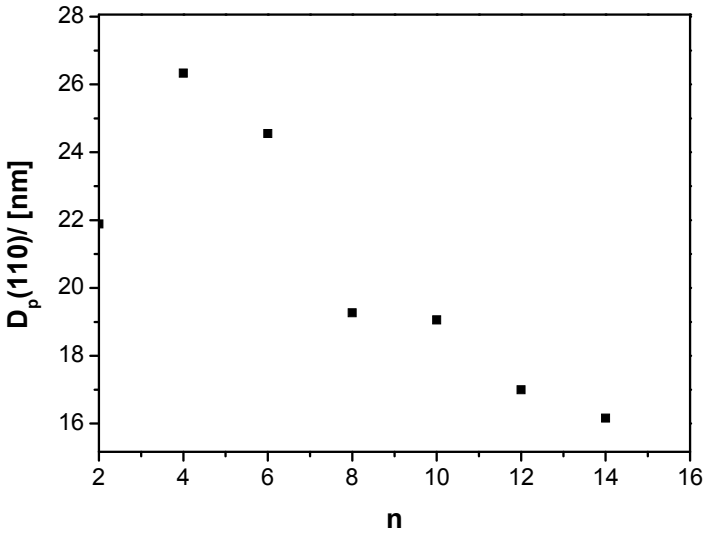
SI-2:

Influence of the chain length of organic acids CH_3-$(CH_2)_n$-COOH on ZnO anisotropy and particle size determined from PXRD data.

PXRD-data:



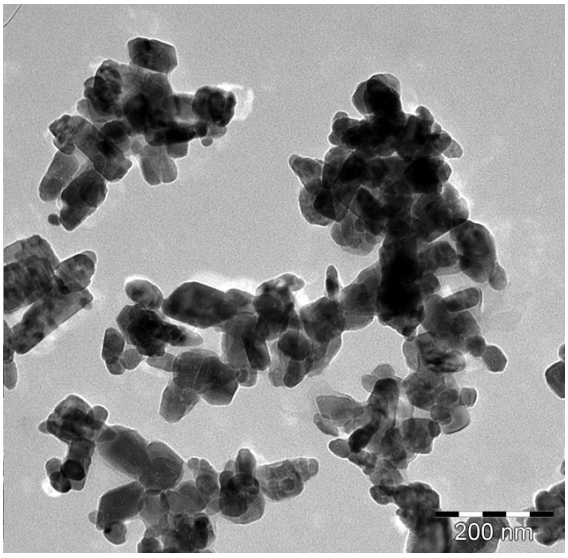
Particle-size:



Electronic Supplementary Material (ESI) for RSC Advances

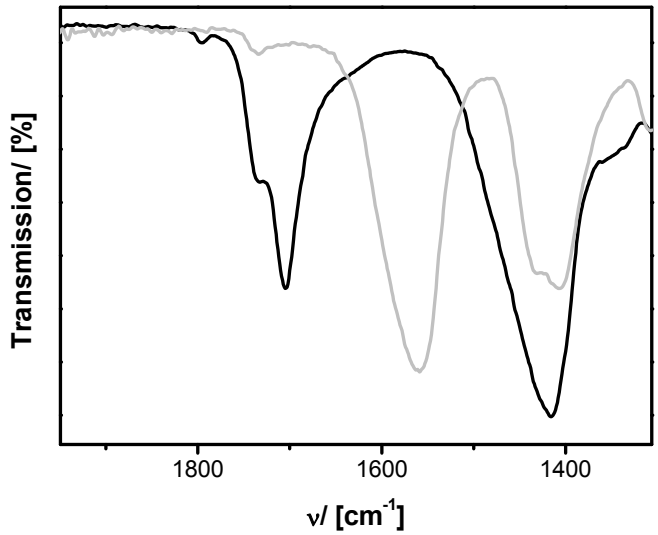
SI-3

TEM micrograph of the ZnO nanoparticles obtained after crystallization in the presence of a PBD additive functionalized with the non interacting -CH_2CH_3 group.



SI-4

FT-IR spectroscopy of the material obtained with PBD-COOH-97

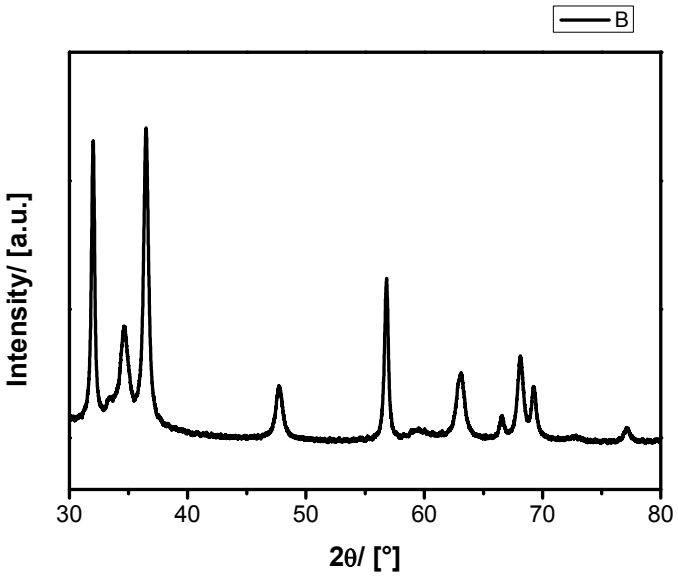


FT-IR spectrum of the pure PBD-COOH-97 polymer as a reference (black).

FT-IR spectrum of the PBD-COOH-97/ ZnO composite (grey).

SI-5

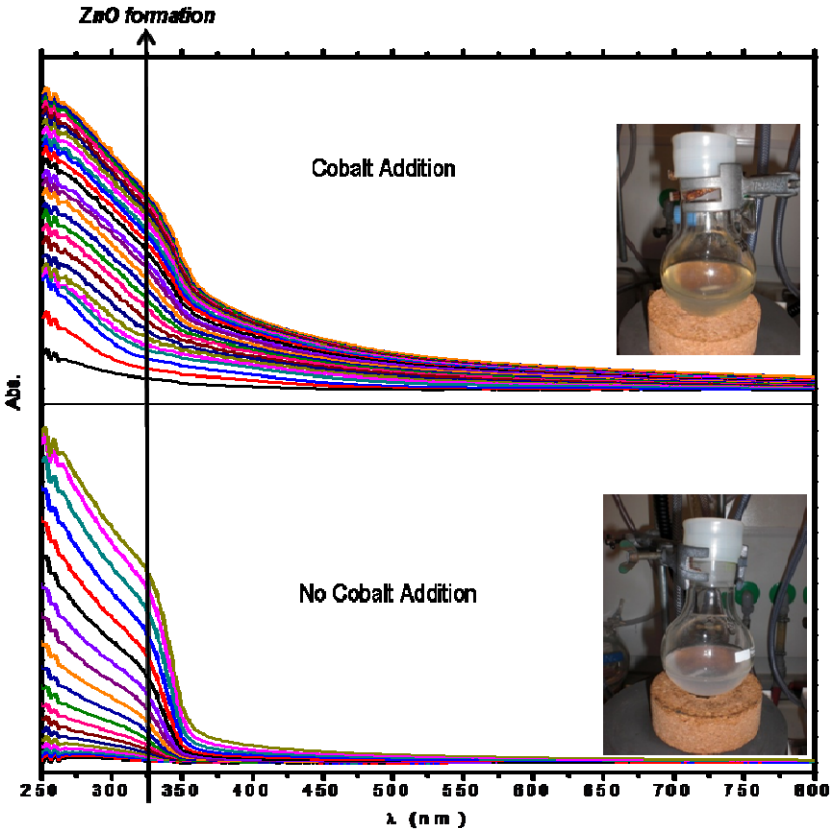
PXRD pattern of the ZnO material obtained in the presence of perchlorate ions.



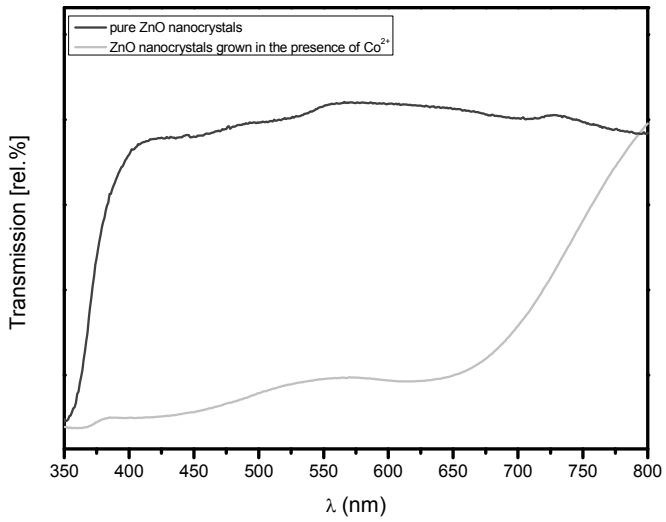
The low intensity and significant width of the [002] signal confirms the plate-like morphology of the sample.

SI-6

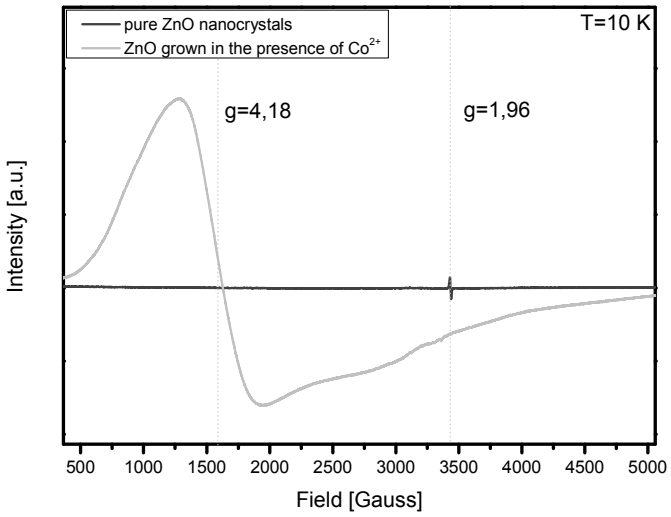
In-situ UV/Vis spectroscopy of ZnO formation in presence of Co^{2+}



UV/Vis spectrum of ZnO nanocrystals grown in the presence of Co^{2+} ions.



X-band EPR spectra of ZnO nanocrystals grown in the presence of Co^{2+}:



SI-7

Mechanism of the photocatalytic decomposition of Rhodamine B

[1] $2\ ZnO + h\nu \rightarrow ZnO\ (e^-) + ZnO\ (h^+)$

[2.a] $ZnO\ (h^+) + RhB \rightarrow RhB^{+\cdot} + ZnO$

[2.b] $ZnO\ (h^+) + H_2O \rightarrow OH + H^{\cdot}$

[2.c] $ZnO\ (e^-) + O_2 \rightarrow ZnO + O_2^-$

[2.d] $ZnO\ (e^-) + O_2^- + H^+ \rightarrow HO_2^- + ZnO$

[2.d] $HO_2^- + H^+ \rightarrow H_2O_2$

[2.e] $ZnO\ (e^-) + H_2O_2 \rightarrow OH^{\cdot} + OH^-$

[3] $OH^{\cdot} + RhB \rightarrow Rh \rightarrow CO_2 + H_2O$

Qu, P.; Zhao, J.; Shen, T.; Hidaka, H. *Journal of Molecular Catalysis A: Chemical* **1998**, *129*, 257.