nanomaterials

MDPI

Supplementary Materials

New Insights into Amino-Functionalization of Magnetic Nanoplatelets with Silanes and Phosphonates

Jelena Papan Djaniš [1,2,*], Griša Grigorij Prinčič [3], Andraž Mavrič [4], Alenka Mertelj [5], Jernej Iskra [3] and Darja Lisjak [1,*]

[1] Department for the Synthesis of Materials, Jožef Stefan Institute, 1000 Ljubljana, Slovenia
[2] Centre of Excellence for Photoconversion, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, 11351 Belgrade, Serbia
[3] Department for Organic Chemistry, Faculty of Chemistry and Chemical Technology, University of Ljubljana, 1000 Ljubljana, Slovenia; grisa.grigorijprincic@fkkt.uni-lj.si (G.G.P.); jernej.iskra@fkkt.uni-lj.si (J.I.)
[4] Materials Research Laboratory, University of Nova Gorica, 5000 Nova Gorica, Slovenia; andraz.mavric@ung.si
[5] Department of Complex Matter, Jožef Stefan Institute, 1000 Ljubljana, Slovenia; alenka.mertelj@ijs.si
* Correspondence: jelena.papan@ijs.si (J.P.D.); darja.lisjak@ijs.si (D.L.)

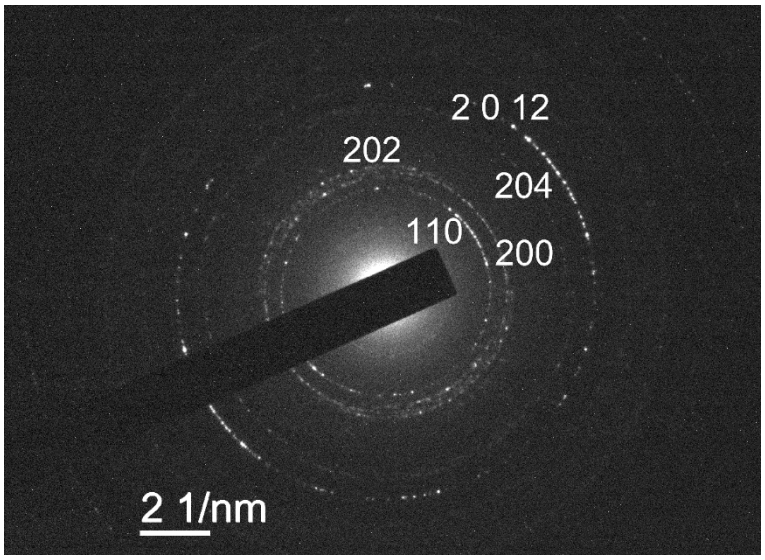

Figure S1. Selected-area electron diffraction (SAED) of the as-synthesized BSHF NPLs shown in Figure 1a. Indices correspond to the magnetoplumbite structure, space group P63/mmc (194).

The surface nominal fraction was calculated from the average size of nanoplatelet (around 50 nm) and thickness (4 nm**).**
S_{tot} is a total surface of BSHF nanoplatelets;
$S_{nanoplatelet}$ is a surface of single nanoplatelet;
N is a number of BSHF molecules;
m_{tot} is a mass of NPLs core;
$m_{nanoplatelet}$ is a mass of single nanoplatelet,
ρ is a density of BSHF ($5.3 \times 10^3 kgm^{-1}$); r=25 nm is the average radius of a BSHF;
d = 4 nm the average height of BSHF;
V is volume;
N_L is a total number of ligand molecules at surface of NPLs core;
n_L are moles of ligand;
M_L is a molar mass of ligand;
m_L is a mass of added ligand.

$$S_{tot} = N \times S_{nanoplatelet} \quad \text{(S1)}$$

$$N = \frac{m_{tot}}{m_{nanoplatelet}} \quad \text{(S2)}$$

$$m_{nanoplatelet} = \rho \times V = 5.3 \times 10^{3} kgm^{-1} \times \pi r^{2} d \quad \text{(S3)}$$

$$S_{nanoplatelet} = 2r^{2}\pi + 2r\pi d \quad \text{(S4)}$$

If we add β molecules/ nm^2:

$$N_L = \beta \times S_{tot} \quad \text{(S5)}$$

$$n_L = \frac{N_L}{N_{NA}} \quad \text{(S6)}$$

$$m_L = n_L \times M_L \quad \text{(S7)}$$