

Supplementary Material

ZnO decorated laser-induced graphene produced by direct laser scribing

Joana Rodrigues[†], Julia Zanoni, Guilherme Gaspar, António J. S. Fernandes, Alexandre F. Carvalho, Nuno F. Santos, Teresa Monteiro, Florinda M. Costa

Departamento de Física & I3N, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal

[†] Corresponding author: phone +351 234247261; email: joana.catarina@ua.pt

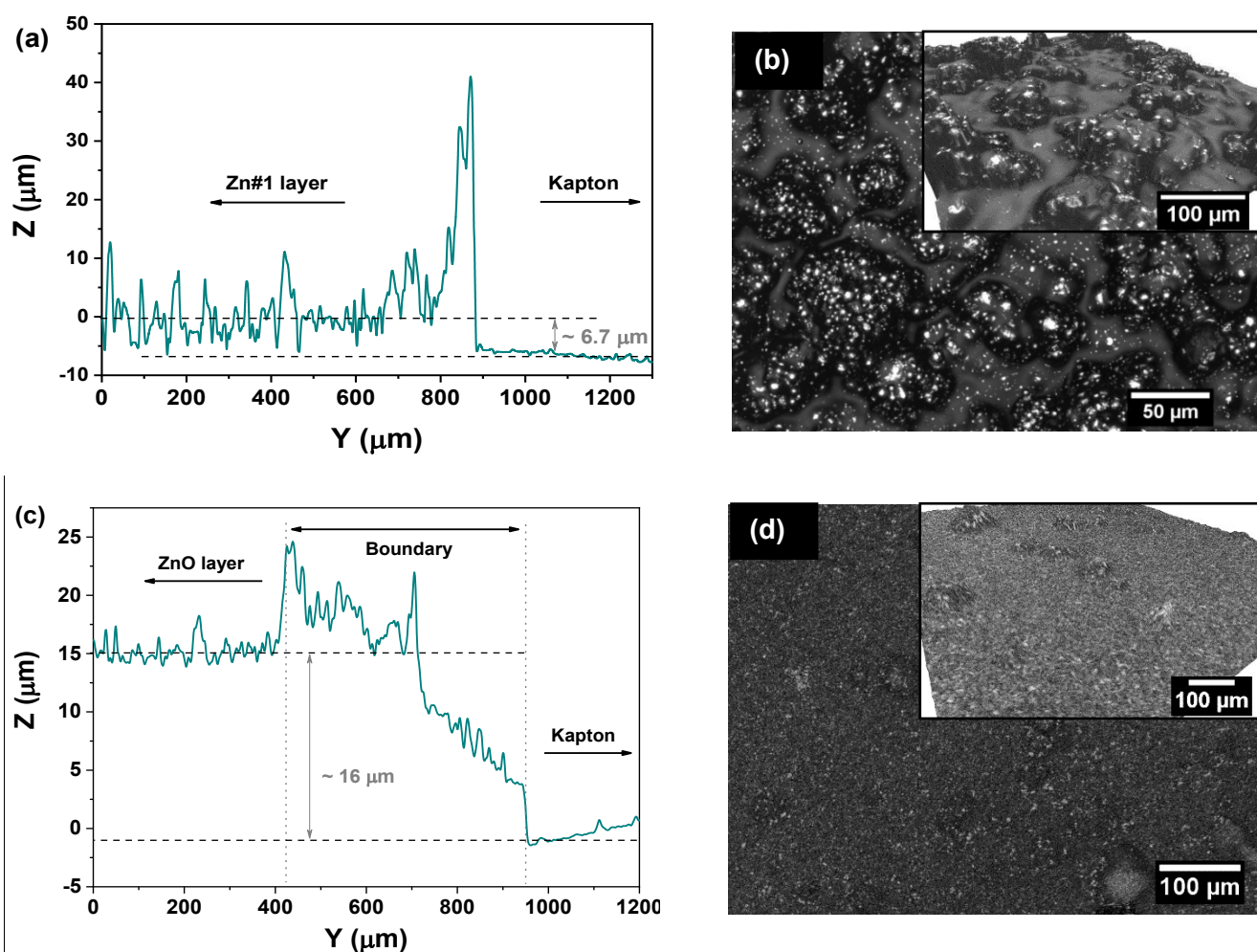


Figure S1 – (a) and (c) Surface profile of the precursor's materials Zn#1 and ZnO paste, respectively. The step height between the two horizontal dashed-lines corresponds to the thickness of the precursor layer. The peak at the interface corresponds to the boundary of the precursor layer. The higher value obtained for Zn#1 is due to the detachment of the layer during the drying process in air. (b) and (d) Optical profilometer image of the Zn#1 and ZnO pastes acquired with 50× and 20× magnifications, respectively. The insets correspond to a 3D image of the same area.

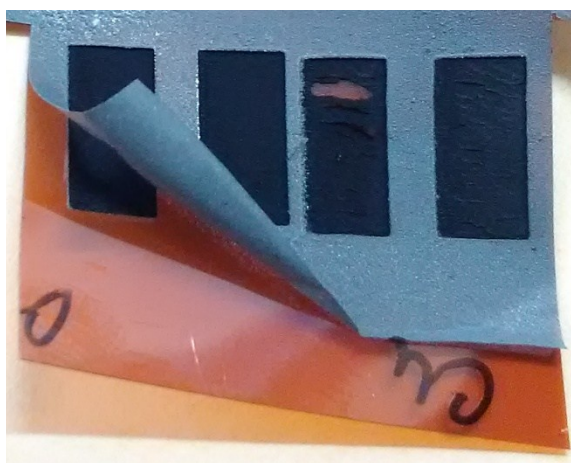


Figure S2 – Photograph showing the peel off of the unprocessed Zn/PVA (Zn#1) layer.

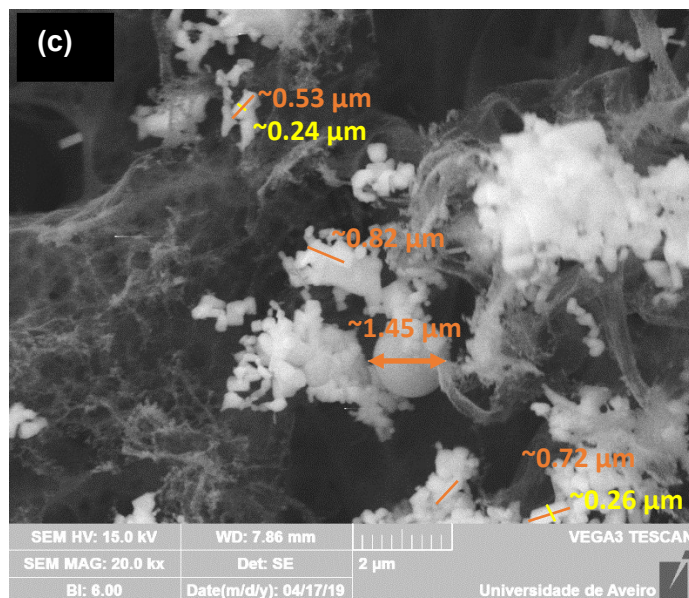
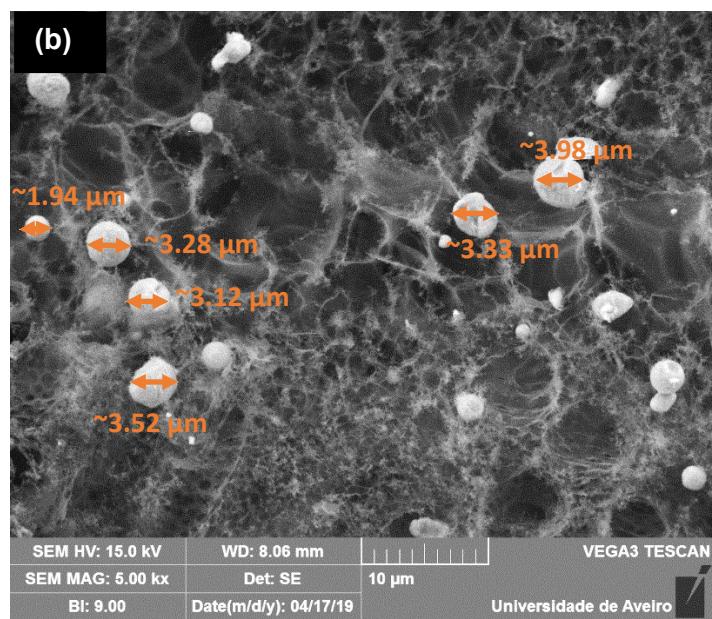
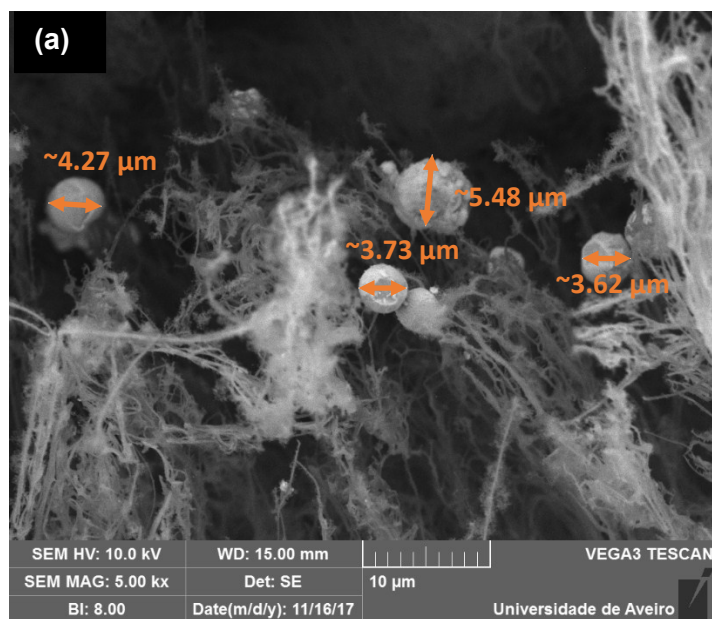


Figure S3 – Examples of the measured dimensions obtained for samples produced with different precursors using the ImageJ software: (a) Zn#1, $P \sim 24$ W, $v = 200$ mm s^{-1} , $d_{laser}=1.8$ cm, (b) Zn#2, $P \sim 22$ W, $v = 150$ mm s^{-1} , $d_{laser}=2.0$ cm and (c) ZnO, $P \sim 22$ W, $v = 150$ mm s^{-1} , $d_{laser}=2.0$ cm.

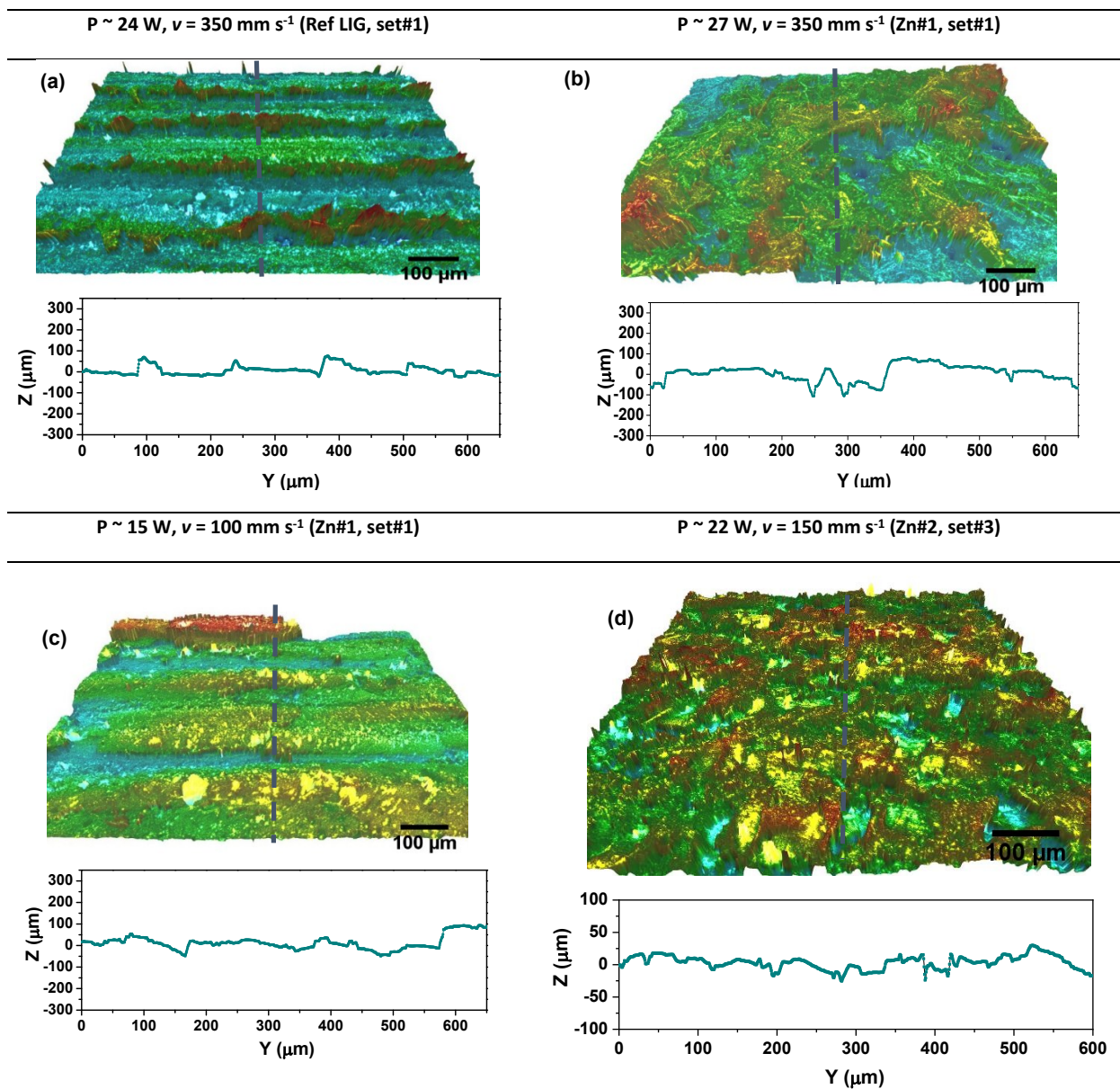


Figure S4 – Optical profilometre images acquired with 20× magnification and surface profile (taken at the centre of the images - marked line). (a) LIG reference sample produced with the same conditions as the one represented in Figure 4c of the main manuscript, without the presence of the Zn layer. (b) - (d) ZnO/LIG composites with different laser processing conditions. The colour scale was defined from blue to red, corresponding to the minimum and maximum of the Z values, respectively, and for each individual sample (peak-to-valley full colour scale).