Synthesis of Polymer/Inorganic Nanocomposite Films using Highly Porous Inorganic Scaffolds

Huanjun Zhang,[a] Matthias Popp,[b] Andreas Hartwig[b] and Lutz Mädler*[a]

[a] *Foundation Institute of Materials Science (IWT), Department of Production Engineering, University of Bremen, Badgasteiner Strasse 3, 28359 Bremen, Germany.*
Fax: +49 421 2185378;
Tel: +49 421 21851200;
E-mail: lmaedler@iwt.uni-bremen.de

[b] *Fraunhofer–Institute for Manufacturing Technology and Advanced Materials (IFAM), Wiener Strasse 12, 28359 Bremen, Germany.*
Fax: +49 421 2246430;
Tel: +49 421 2246470;
E-mail: andreas.hartwig@ifam.fraunhofer.de

Enclosure: Three figures

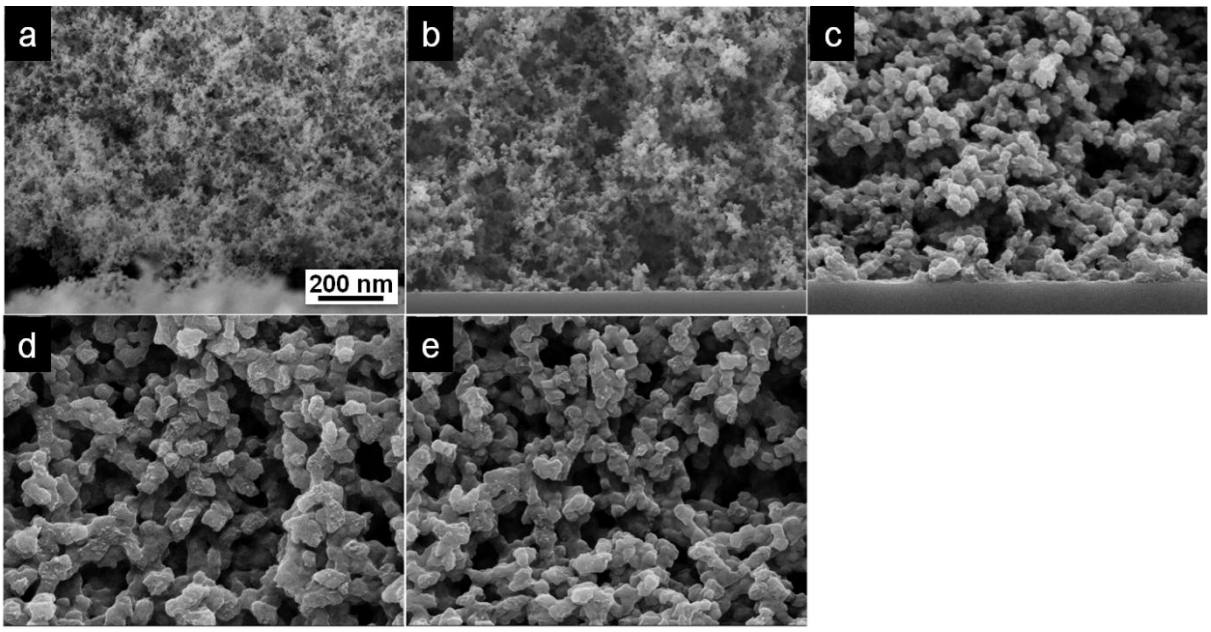

Fig. S1 The morphology/structure evolution of the polycyanoacrylate/SnO_2 composite films: a) 10 min, b) 30 min, c) 60 min, d) 120 min and e) 180 min. The shown SEM images were recorded at the film/glass interface region for each sample.

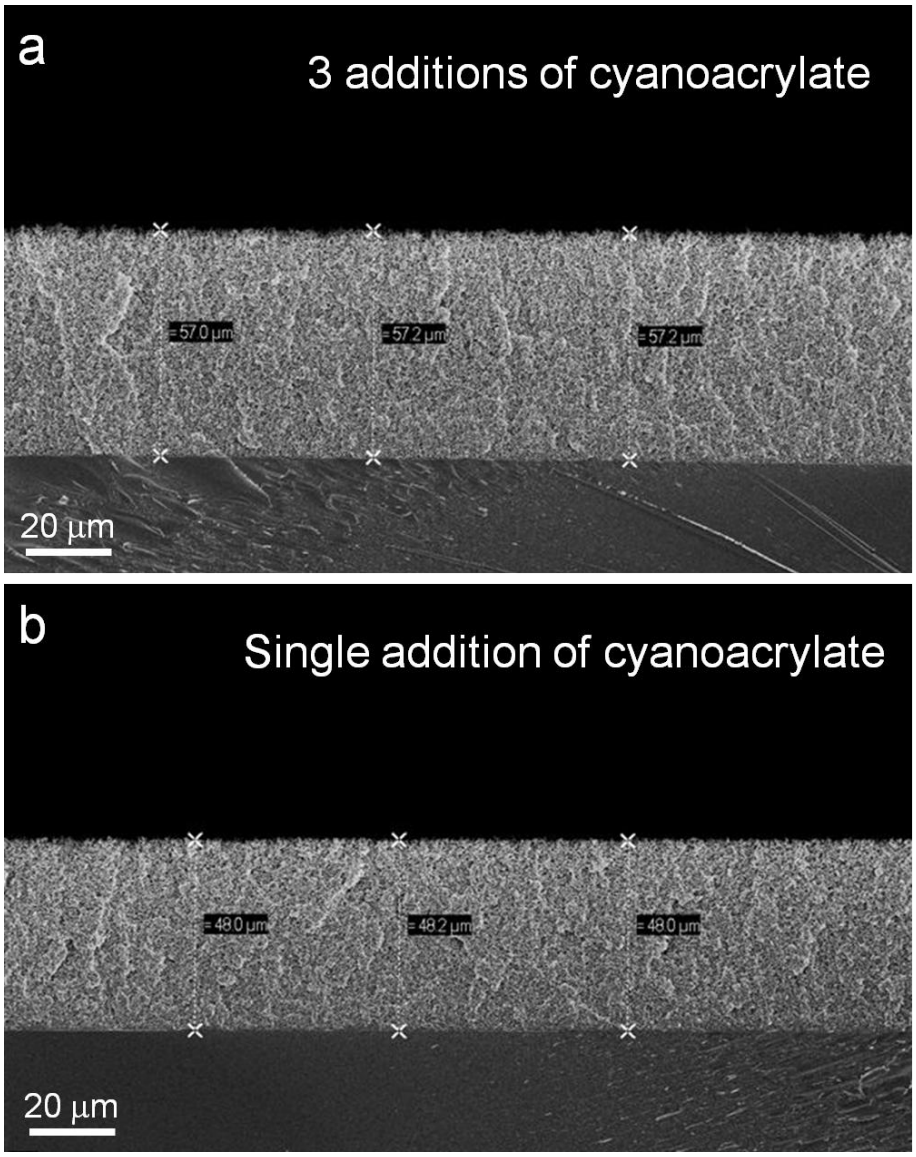

Fig. S2 Effects of refreshing the monomer reservoir on the nanocomposite film growth: refreshing twice the monomer reservoir during the polymerization process results in a thicker (57 μm) nanocomposite film than that obtained without refreshing the monomer reservoir (48 μm). Note that the two SnO_2 layers were prepared here with a larger nozzle-to-substrate distance (25 cm, as compared with 20 cm to prepare layers reported in Fig. 4). The larger distance results in a thinner SnO_2 scaffold layer, and subsequently, leads to a thinner composite film in this figure (sample (b), 48 μm) than that reported in Fig. 4b.

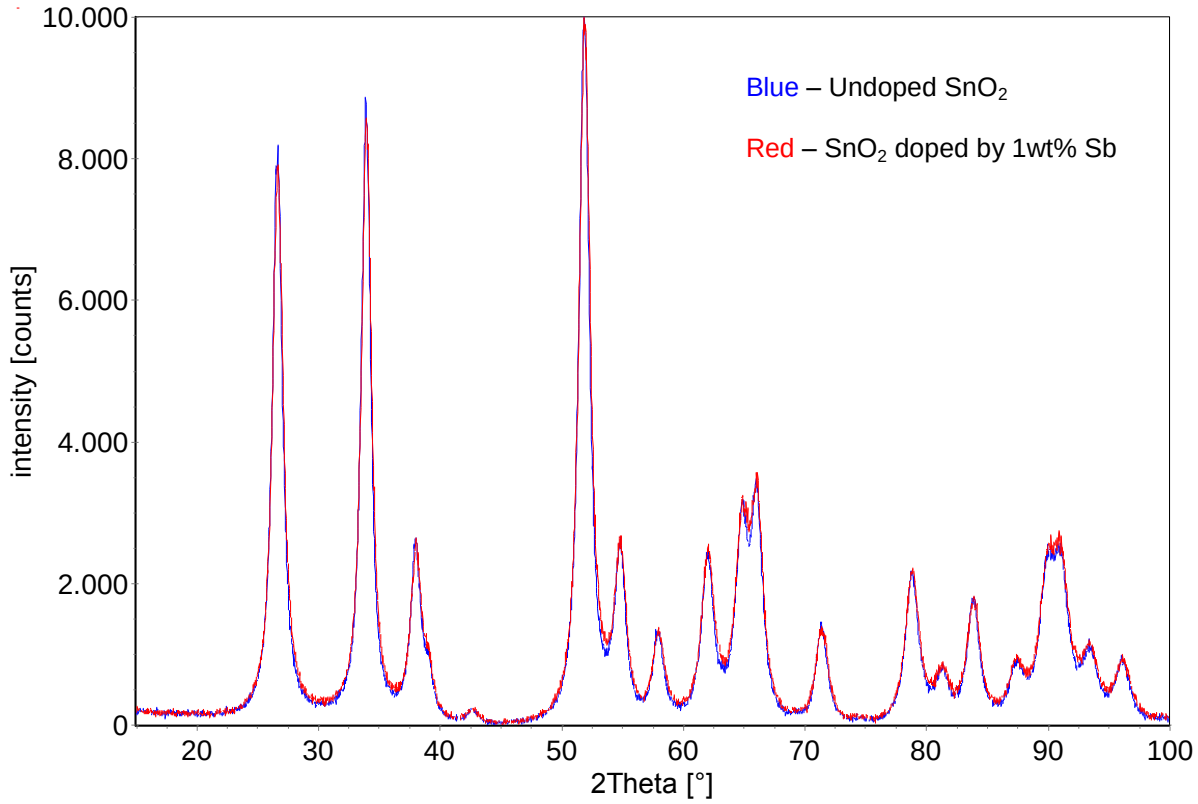

Fig. S3 Powder XRD patterns of the undoped and 1wt% Sb-doped SnO_2 samples (color in electronic file).