Electronic Supplementary Information: Chip-on-Foil Devices for DNA Analysis Based on Inkjet-Printed Silver Electrodes

Sebastian Wünscher,[a,b]‡ Barbara Seise,[d,e]‡ David Pretzel,[a,b] Sibyll Pollok,[d,e] Jolke Perelaer,[a,b,c] Karina Weber, [d,e] Jürgen Popp,[d,e] Ulrich S. Schubert[a,b,c]*

[a] Laboratory of Organic and Macromolecular Chemistry (IOMC), Friedrich Schiller University Jena, Humboldtstr. 10, 07743 Jena, Germany.

[b] Jena Center for Soft Matter (JCSM), Friedrich Schiller University Jena, Philosophenweg 7, 07743 Jena, Germany.

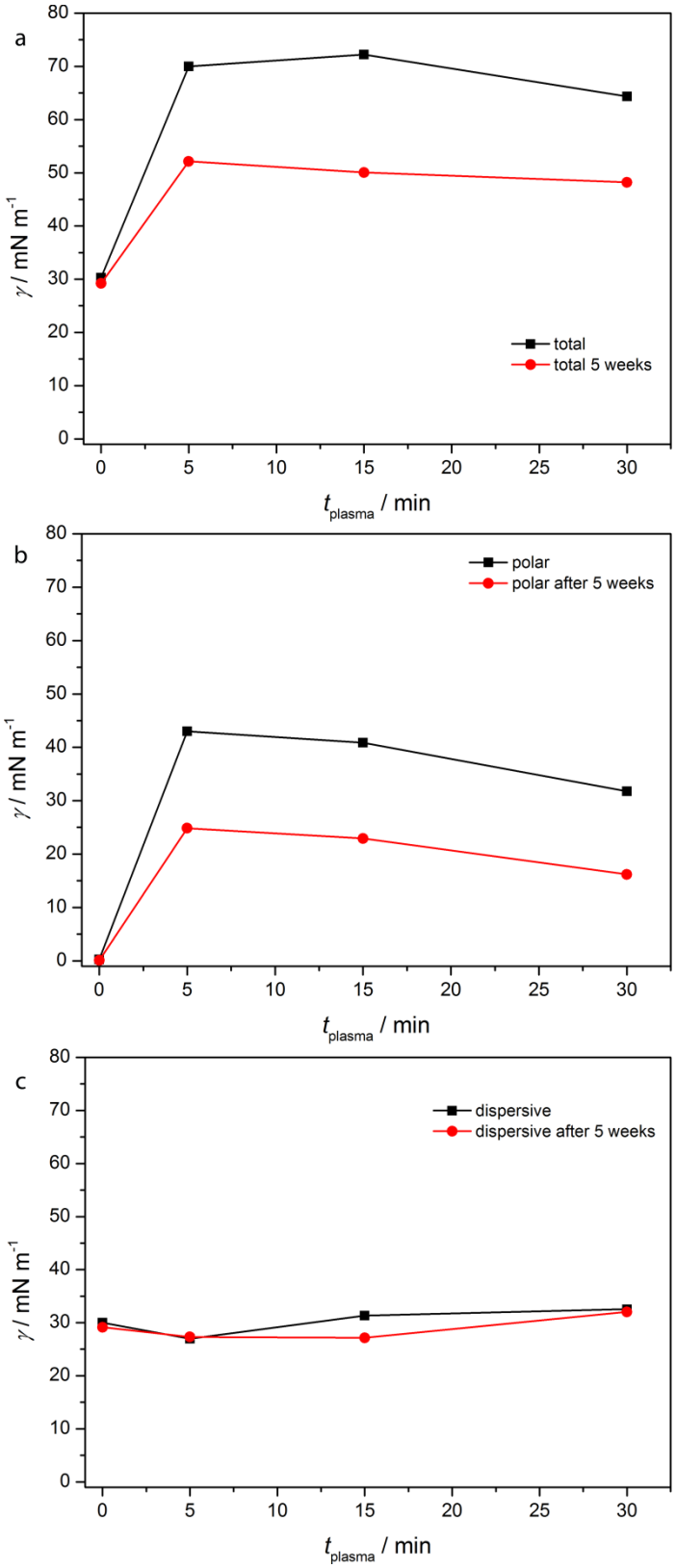
[c] Dutch Polymer Institute (DPI), PO Box 513, 5600 MB Eindhoven, The Netherlands.

[d] Institute of Photonic Technology, Albert-Einstein-Str. 9, 07745 Jena, Germany.

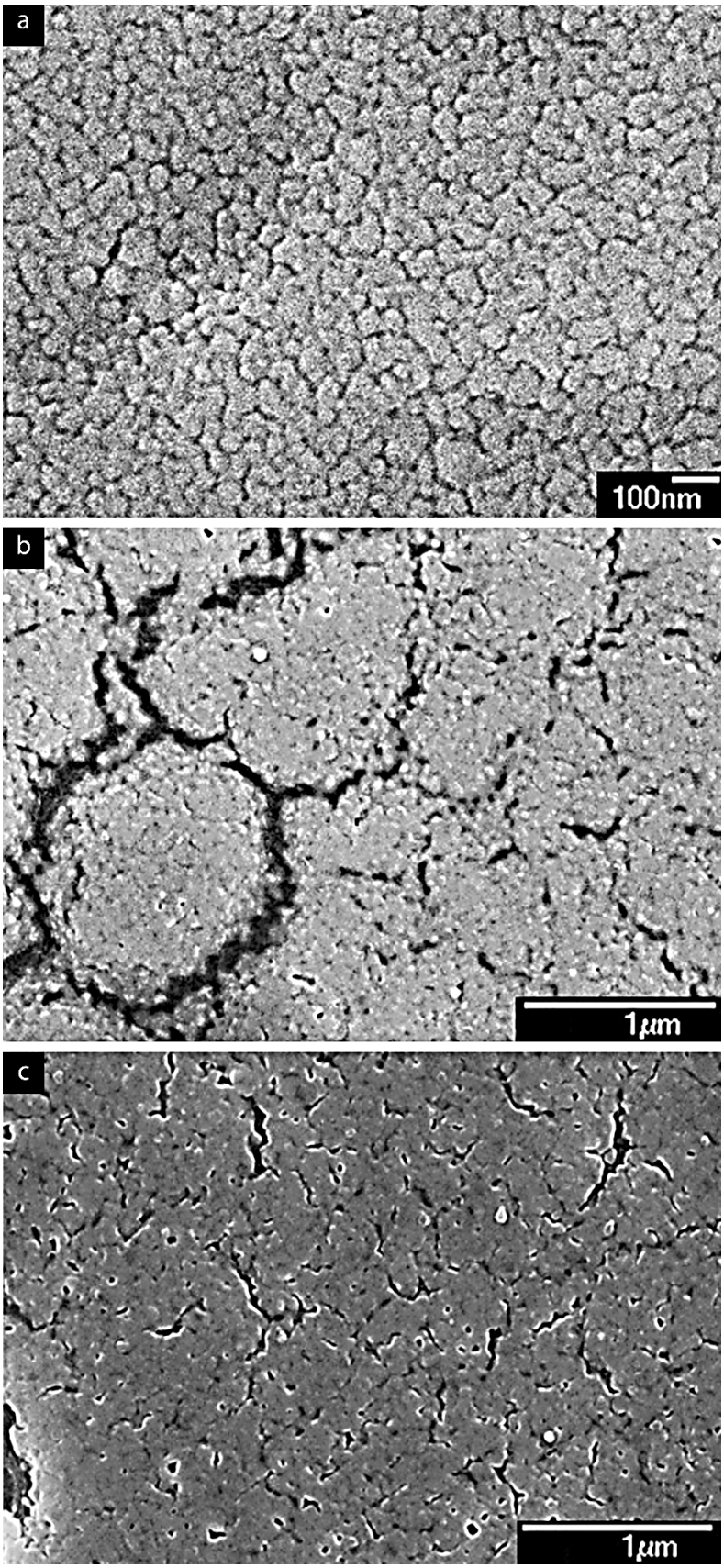
[e] Institute of Physical Chemistry and Abbe Center of Photonics, Friedrich Schiller University Jena, Helmholtzweg 4, 07743 Jena, Germany.

‡ Both authors contributed equally to the presented work.

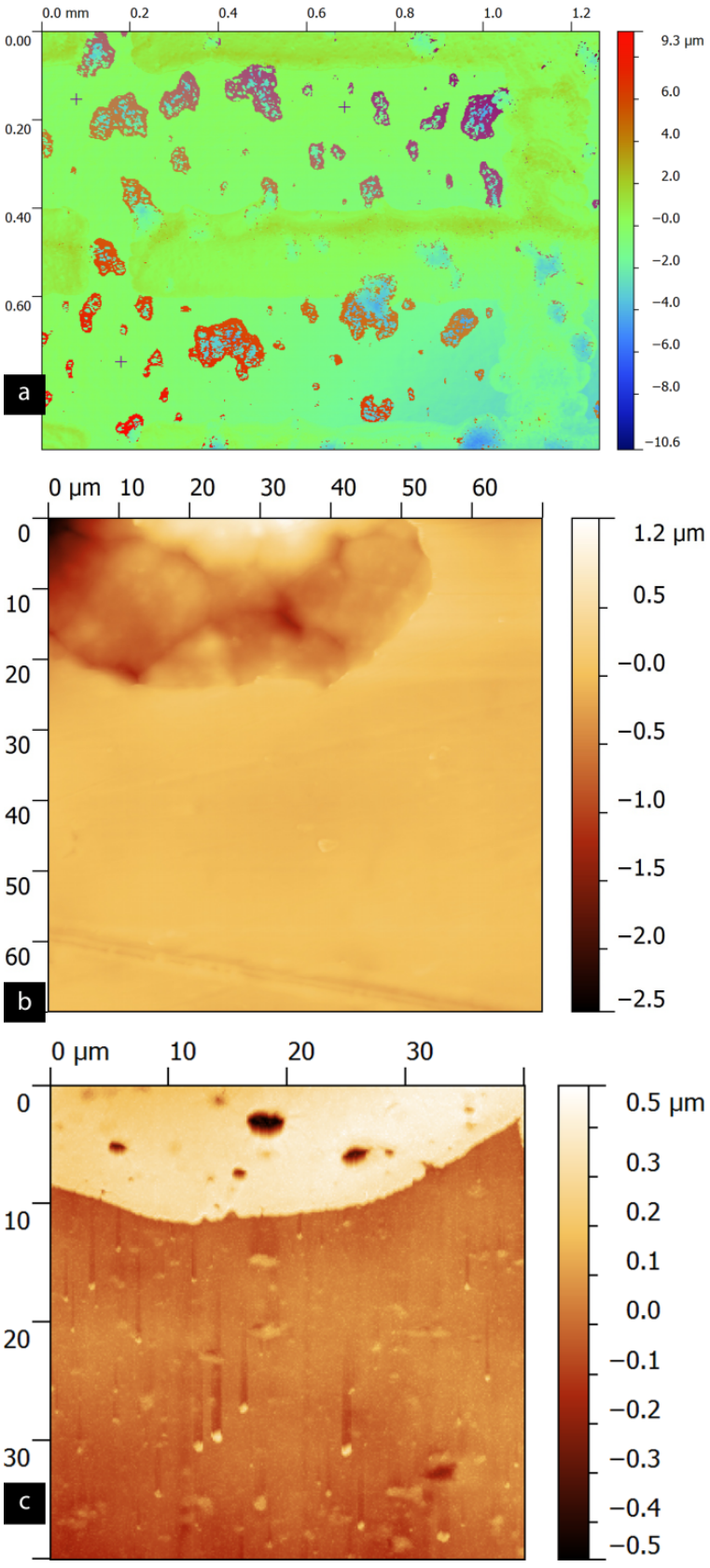
Email: ulrich.schubert@uni-jena.de



Supplementary Information Figure 1. Total surface energy γ (**a**); polar (**b**) and dispersive (**c**) fraction of the total surface energy of polypropylene foil in dependence of plasma treatment time.

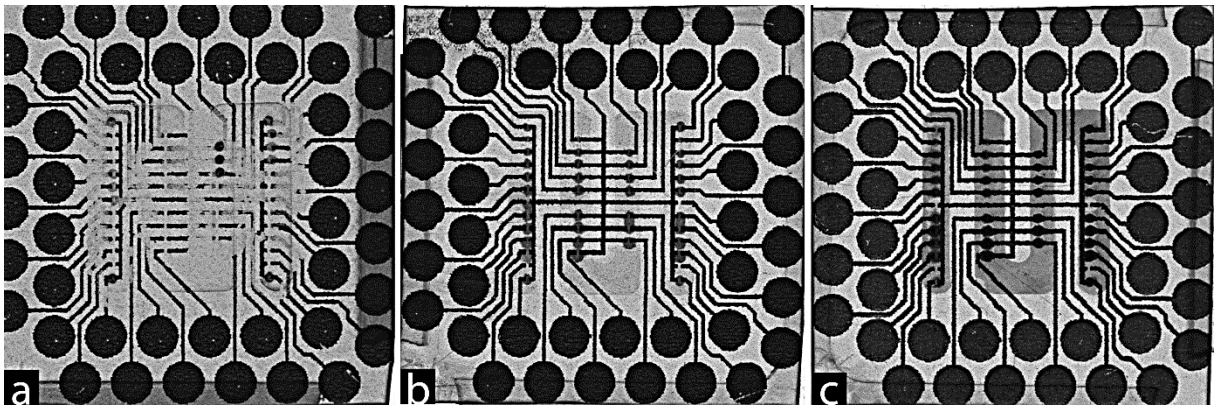


Supplementary Information Figure 2. SEM images of as-printed (a), 15 min argon plasma sintered (**b**) and 30 min argon plasma sintered (**c**) Harima NPS-J electrodes.



Supplementary Information Figure 3. 2D profile of Harima NPS-J electrodes on PP foil (**a**); atomic force microscopy image (AFM) of PP foil (**b**) and low pressure argon plasma sintered (30 min) Harima NPS-J electrode (**c**).

Supplementary Information Figure 4a shows multiple defects of a size of up to 200 µm x 200 µm on the surface of the PP foil. The depth of these defects ranges between 0.2 µm to more than 1 µm, which exceeding the height of a single layer printed silver track. Height measurements are therefore not reliable. Additionally, different analysis methods, like optical profilometry and AFM, of the same structure result in different height values of 0.53 µm and 0.34 µm, respectively.



Supplementary information Figure 4. Adhesion and background signal for analysis chips printed from Harima NPS-J after low pressure argon plasma sintering for 5 minutes (**a**), 15 minutes (**b**) and 30 minutes (**c**).