Electronic Supporting Information for: Nano IR spectroscopy on Silicon-Supported Organic–Inorganic Hybrid Materials

Carolin Mehrmann,[a] Jacob Johny,[b] Petra Ebbinghaus,[a] Martin Hammerschmidt,[c] Ankita Das,[a] Xin Wei,[d] Marc F. Tesch[b] and Martin Rabe[*a]

[a] Max Planck Institute for Sustainable Materials, Max-Planck-Str. 1, 40237 Düsseldorf, Germany; [*]E-mail: m.rabe@mpi-susmat.de
[b] Max Planck Institute for Chemical Energy Conversion, Stiftstraße 34-36, 45470 Mülheim an der Ruhr, Germany
[c] JCMwave GmbH, Bolivarallee 22, 14050 Berlin, Germany
[d] Institute of Inorganic Chemistry (IAC), RWTH Aachen University, Landoltweg 1a, 52074 Aachen, Germany
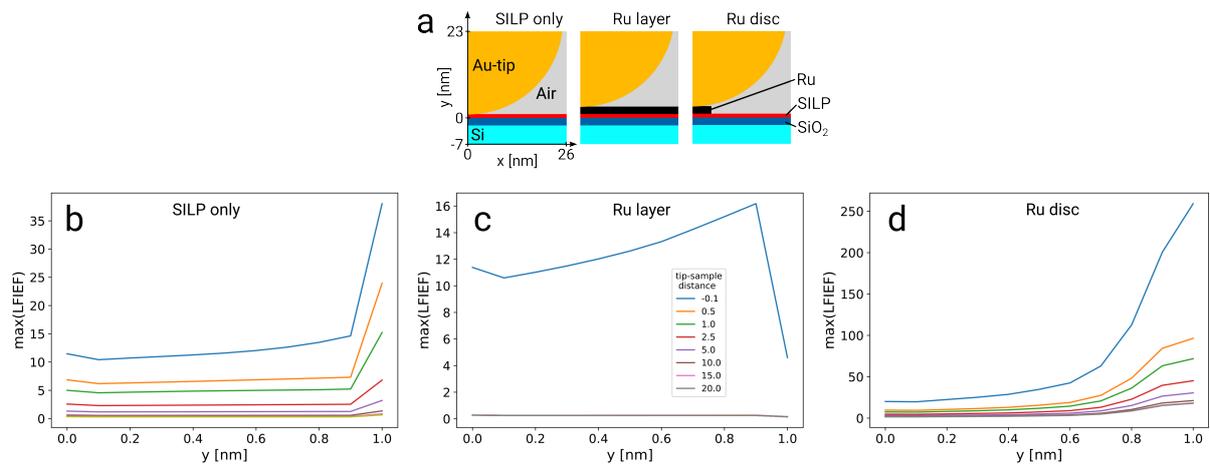
Contents

1 Supporting FEM results

Figure S1: 2-D layouts of used models (a) and comparison of maximum LFIEF values as function of y-position in modeled SAM layers for different tip-sample distances. SILP only (b), continuous Ru layer (c), and Ru disc (d).
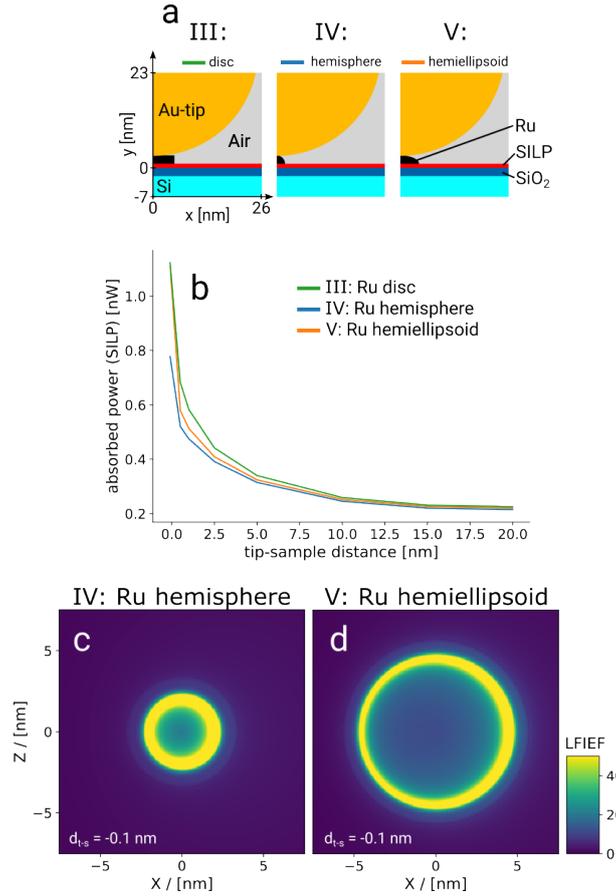
Figure S2: 2-D layouts of additional models of different nanoparticle shapes (a). Dependency of power absorbed by SILP on the tip-sample distance (b). Local field intensity enhancement maps at y = 0.9 nm for models IV (c) and V (d). Maximum local field intensity enhancement factor (LFIEF) values in the images c and d go up to about 250 , the smaller scale was chosen for visibility and comparability reasons.
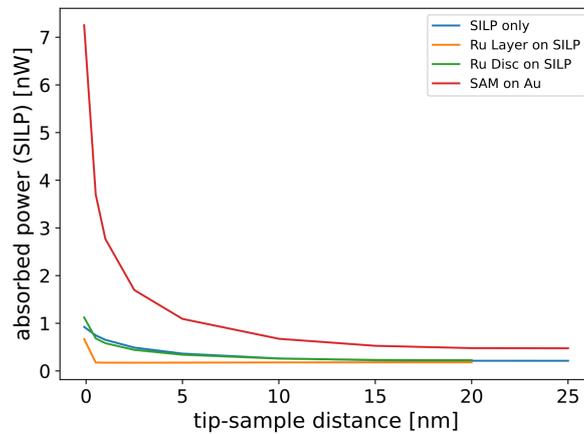

Figure S3: Dependency of power absorbed in the ultrathin layers on tip-sample distance extracted from FEM simulations. Additional data of ultrathin monolayer (SAM) on Au in comparison to SILP models discussed in the main paper and depicted in figure S1a.
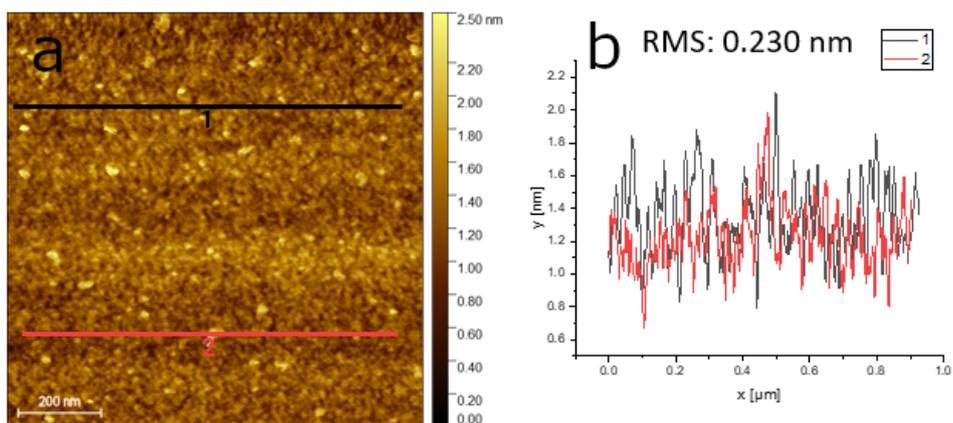
2   Supporting AFM-IR results

Figure S4: AFM topography (a) and line scans (b) of Piranha-cleaned ultraflat Si-wafer used as substrate.
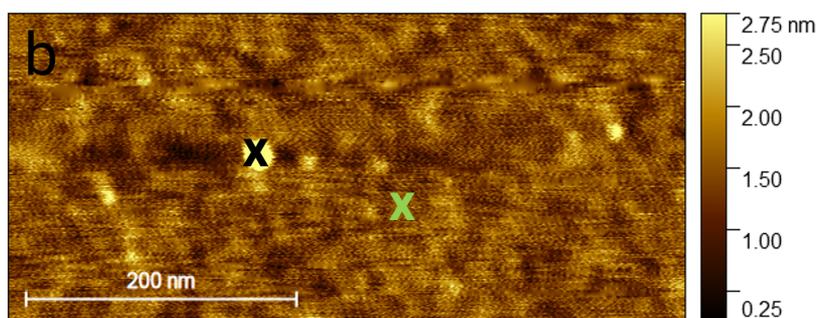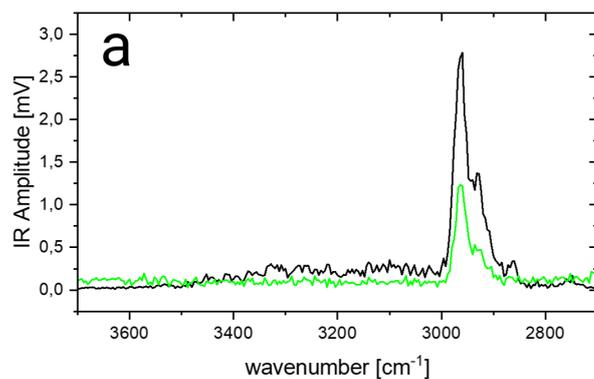

Figure S5: Local AFM-IR spectra on SILP (a), taken on or off the dot-like feature as indicated by the markers in the topography image (b).
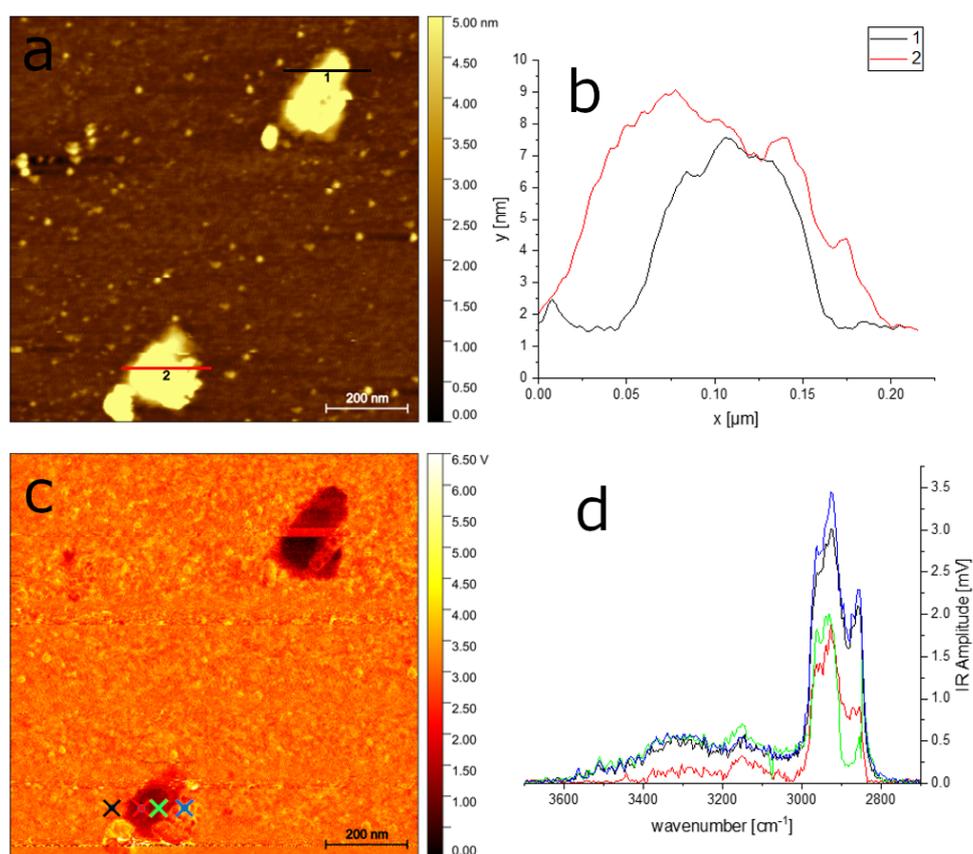
Figure S6: Additional AFMIR data on RuNP@SILP. Topography (a) and line scan of inorganic features (b). Nano-IR image, recorded at $2956\,\mathrm{cm^{-1}}$ (c) and local nano-IR spectra (d) recorded at the positions marked in c.