

1 **Direct Chemical Lithography Writing on 2D Materials by Electron Beam Induced Chemical Reactions**

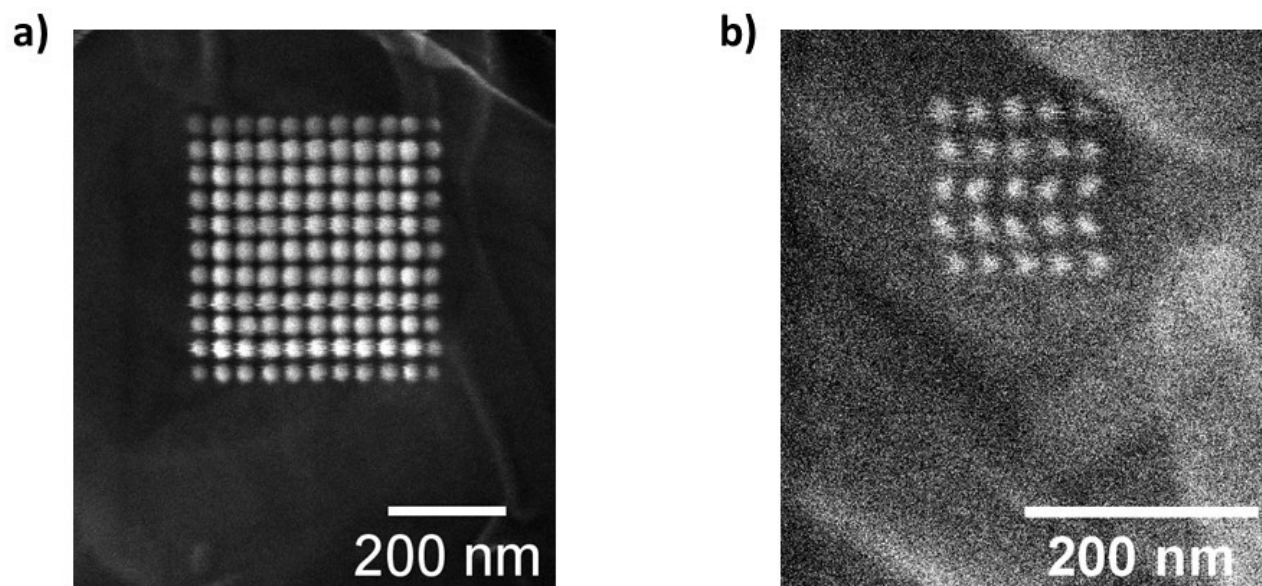
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8 **Fig. S1** SEM images of deposited Pt NPs on TOGO sheet by EBL. Deposition time: (a) 0.03 s; (b) 0.01 s.

9 Distance between NPs: (a) 40 nm; (b) 30 nm

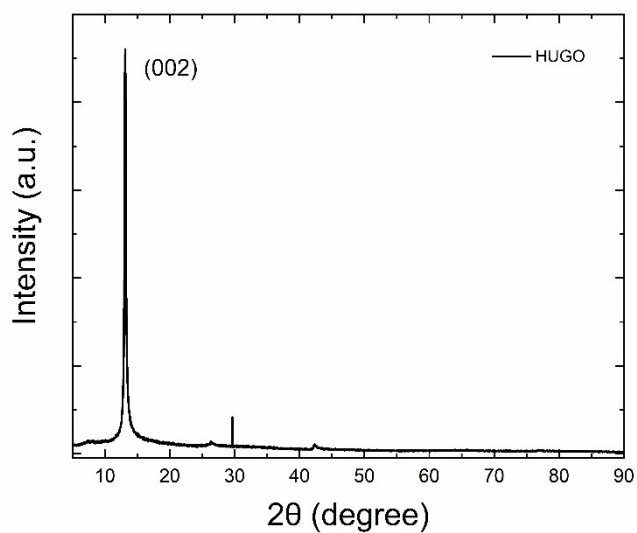
10 SEM images clearly confirmed the possibility for EBL to unambiguously distinguish Pt NPs with spatial
11 distributions of up to 30 nm. According to Fig. S1a, the regular square lattice pattern of individual NPs can be
12 nicely seen for the deposition time of 0.03 s and spatial distance between NPs of 40 nm. Furthermore,
13 decreasing of deposition time up to 0.01 s allowed to deposit NPs with spatial distribution of 30 nm (Fig. S1b).
14 However, the contrast between NPs and support became almost negligible for SEM to distinguish NPs, while
15 EBL itself is able to deposit NPs at distance up to 10 nm.

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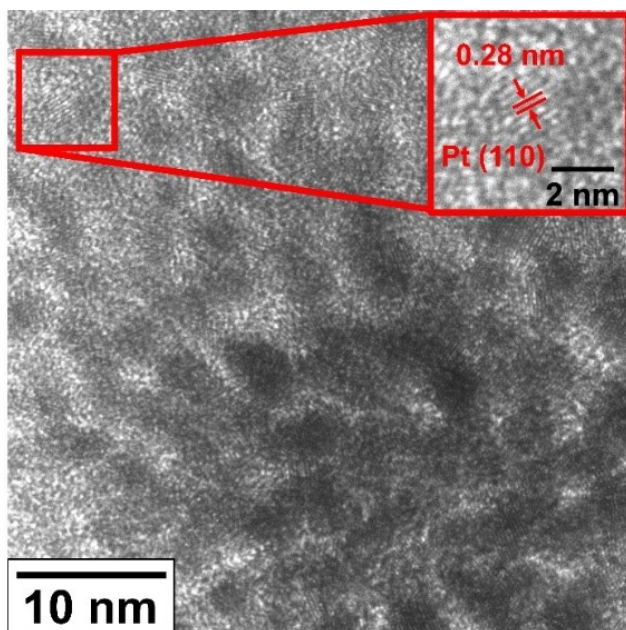


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18 **Fig. S2** XRD spectrum of HUGO support

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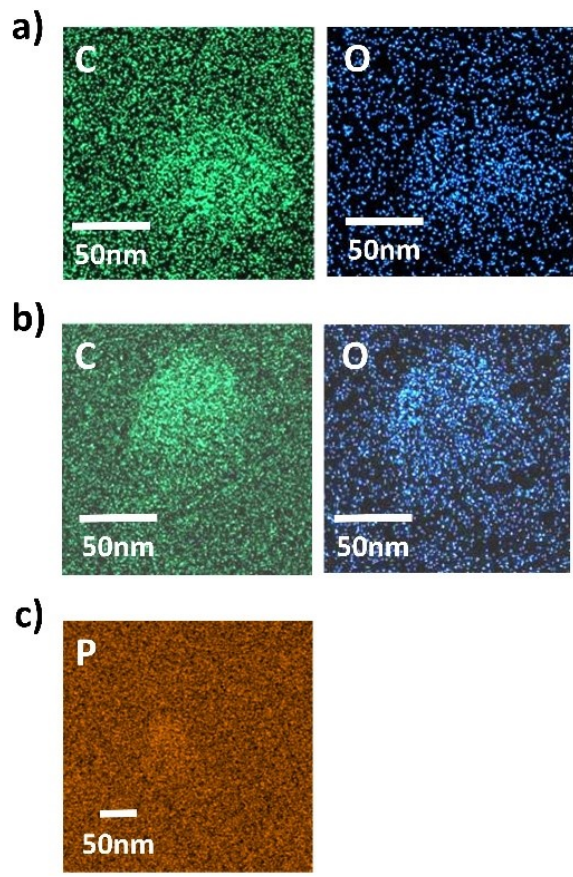


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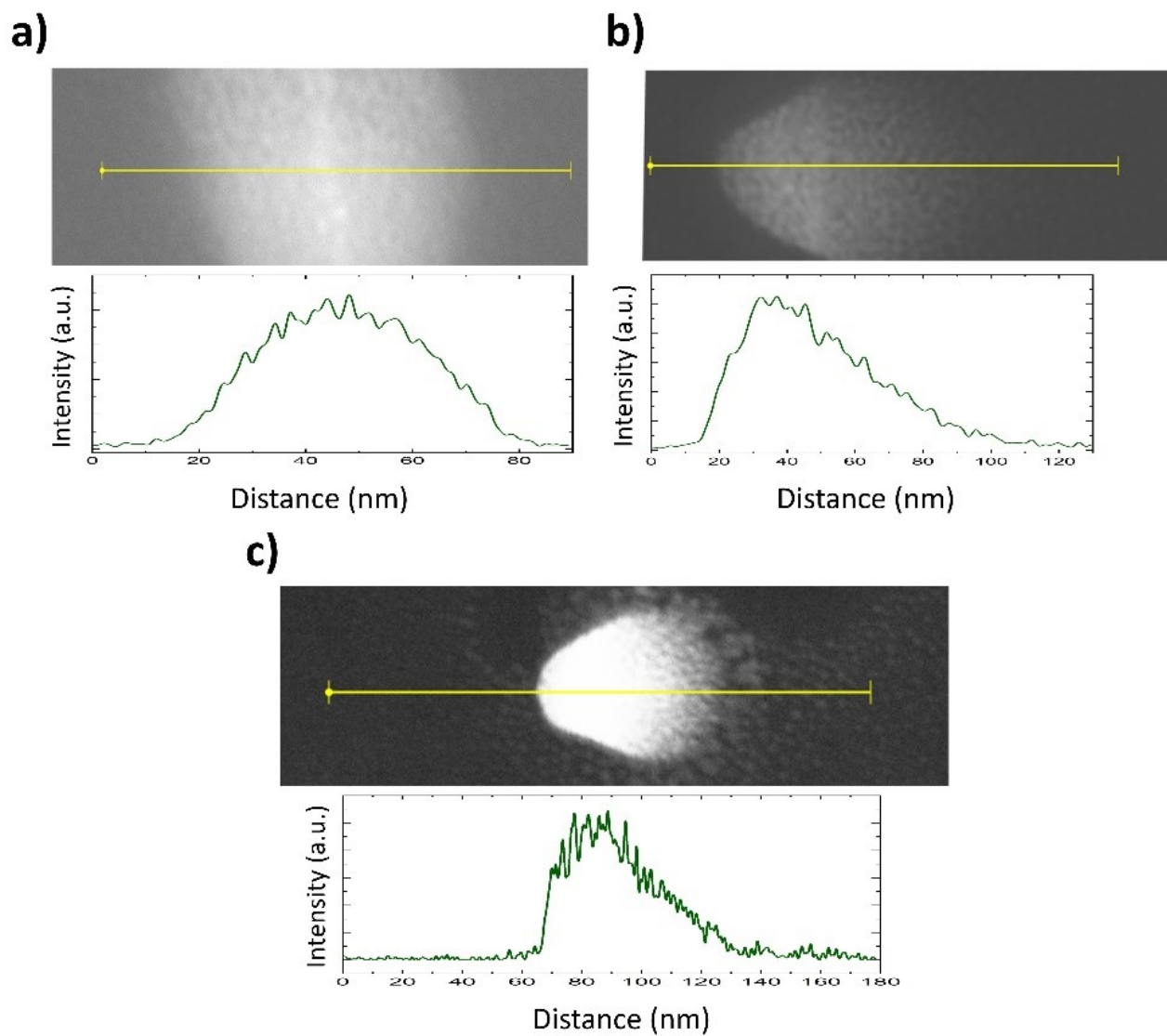
22 **Fig. S3** HR-TEM image of Pt/TOGO NPs used for FFT pattern calculation with focus on Pt lattice structure

23 corresponding to Pt [110]

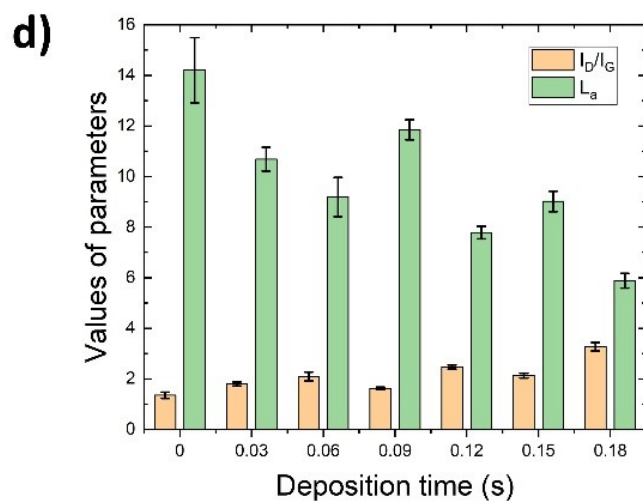
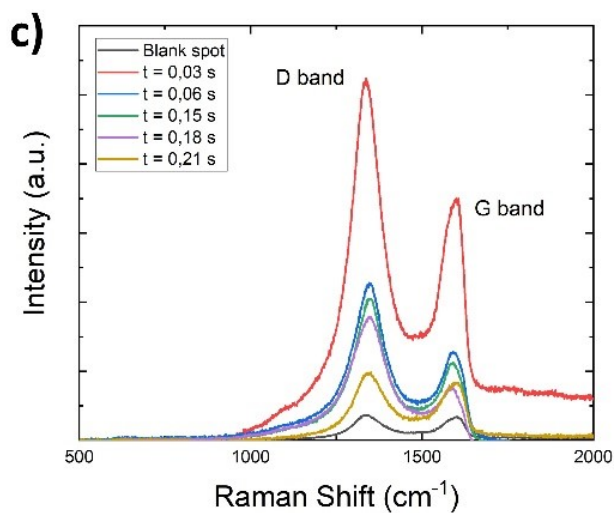
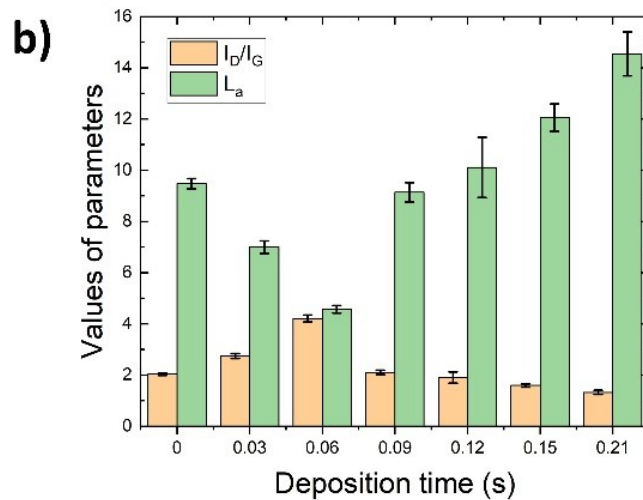
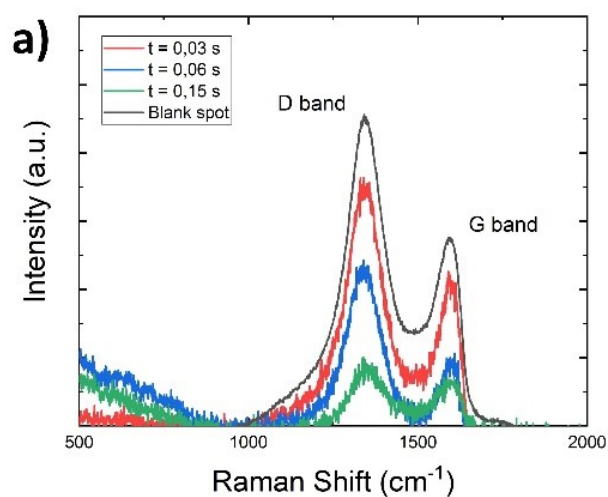
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26 **Fig. S4** EDS elemental mapping images of C, O and P from deposited Pt NPs: (a) TOGO sheet; (b) HUGO
27 sheet; (c) BP sheet



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29 **Fig. S5** Profile of deposited Pt NPs: (a) TOGO; (b) HUGO; (c) BP

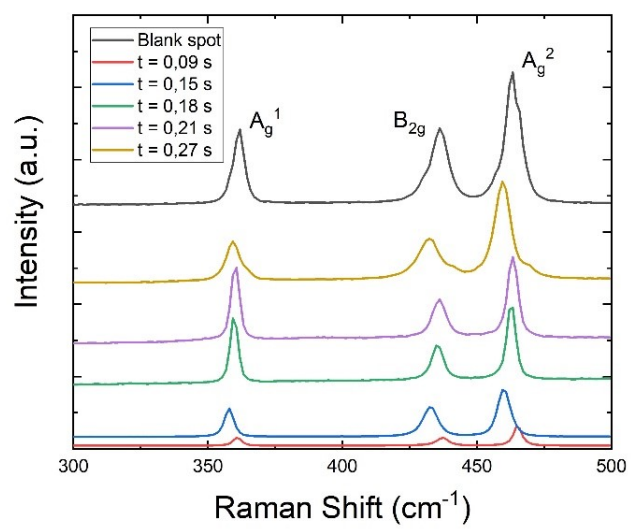


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31 **Fig. S6** Raman spectra of deposited Pt NPs: (a) TOGO; (c) HUGO. Computed values of I_D/I_G ratio intensity

32 and crystallite size L_a for Raman spectra of deposited Pt NPs: (b) TOGO; (d) HUGO

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35 **Fig. S7** Raman spectra of deposited Pt NPs on BP