Supplementary materials

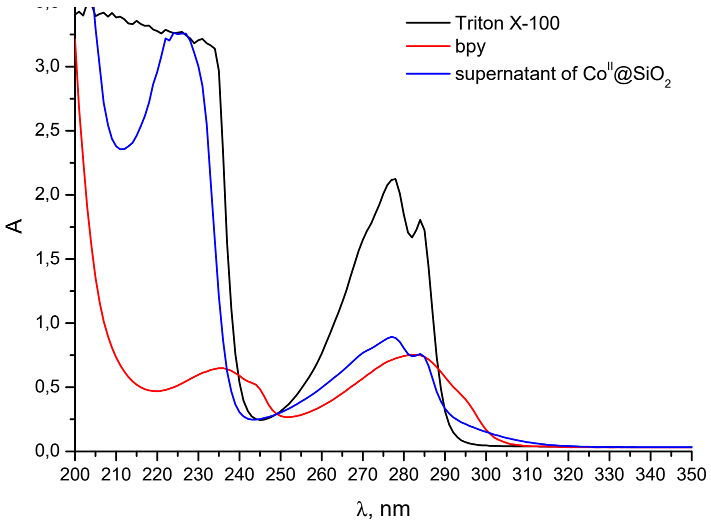


Figure 1. UV-vis spectra of supernatant diluted 300 times by ethanol after synthesis of w/o Co^{II}@SiO$_2$ (Co^{II}(bpy)$_3$ as precursor) (**blue**) and ethanol solutions of bpy (C = 5×10^{-5} mol·L^{-1}, **red**) and Triton X-100 (C = 0.9 g·L^{-1}, **black**).

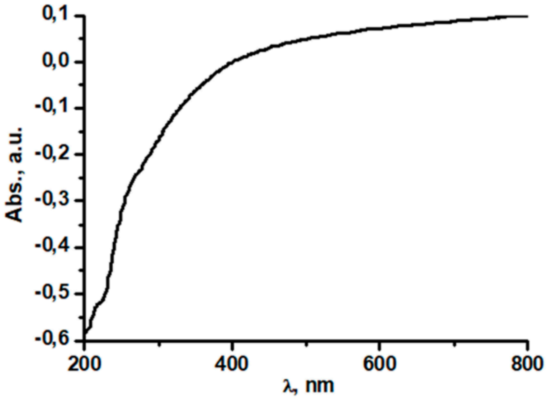


Figure S2. UV–Vis diffuse reflectance spectra of "empty" SiO$_2$.

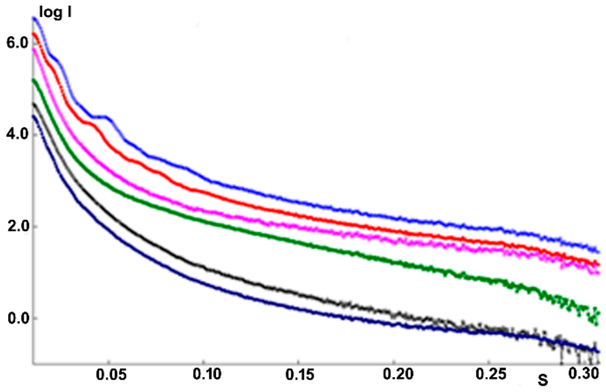


Figure S3. SAXS diffraction intensity profiles at 23 °C (in logarithmic scale) top to bottom: **(blue)** w/o Co^{II}@SiO$_2$ (CoCl$_2$ as precursor); **(red)** w/o Co^{II}@SiO$_2$ (Co^{II}(bpy)$_3$ as precursor); **(magenta)** Stöber Co^{II}@SiO$_2$ (CoCl$_2$ as precursor); **(green)** Stöber Co^{II}@SiO$_2$ (Co^{II}(bpy)$_3$ as precursor); **(dark)** "empty" Stöber SiO$_2$; **(dark blue)** "empty" w/o SiO$_2$. Scattering vector $s = 4\pi \mathrm{Sin}\theta/\lambda$, Å^{-1}; λ = 1.5418Å is the wavelength of the X-ray beam.

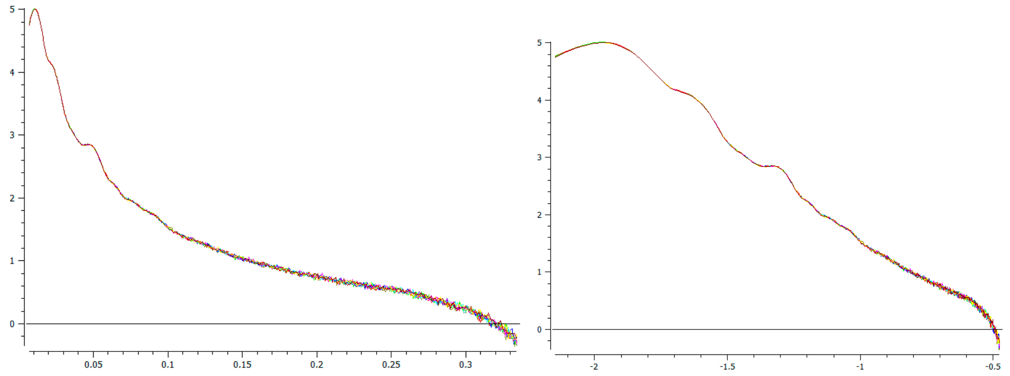
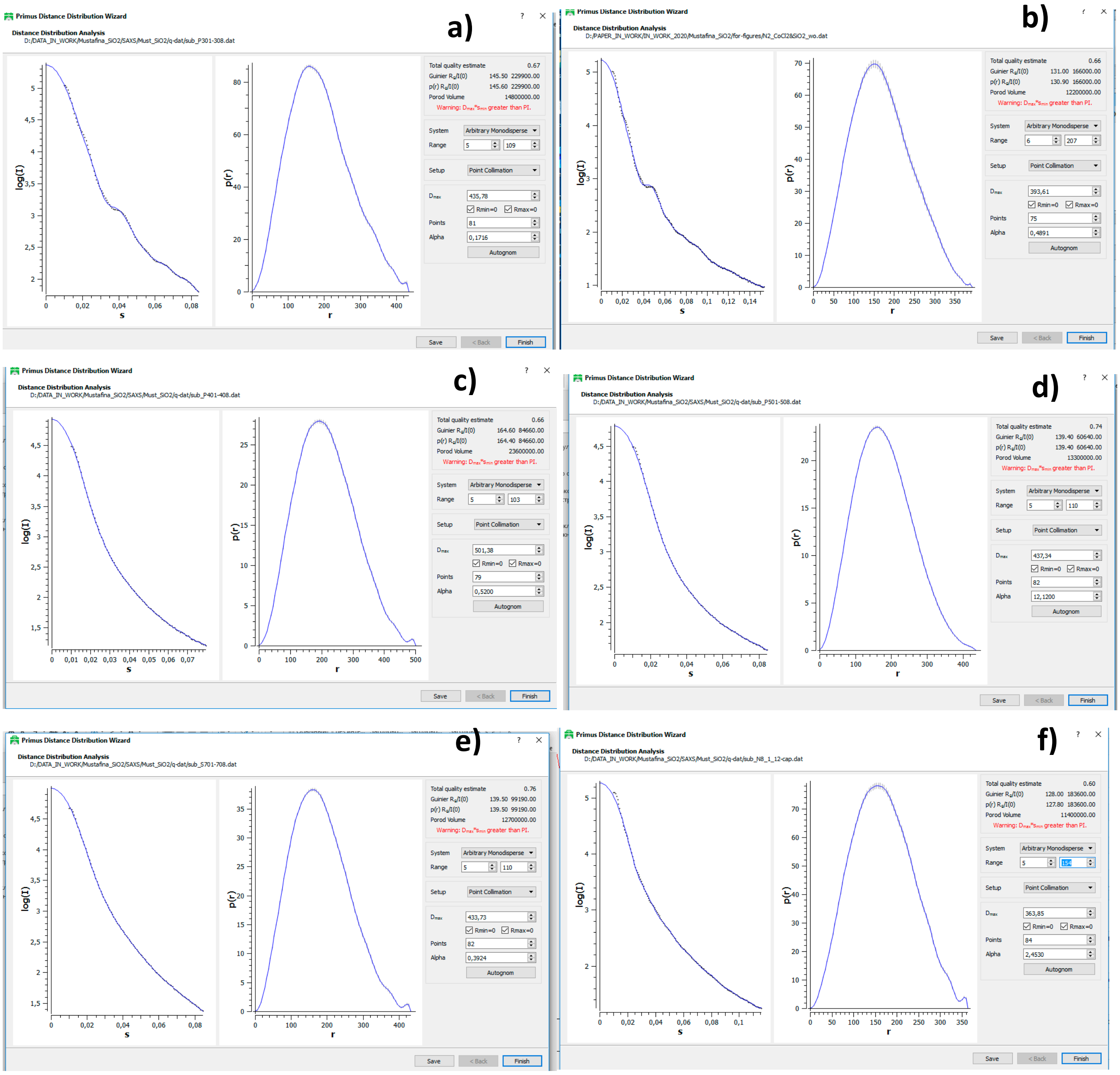


Figure S4. X-ray scattering curves of w/o Co^{II}@SiO$_2$ in logarithmic (**left**) and double logarithmic (**right**) scale. Different colors of curves are corresponded to 8 consistent experiments.



a)
Primus Distance Distribution Wizard
Distance Distribution Analysis
D:/DATA_IN_WORK/Mustafina_SiO2/SAXS/Must_SiO2/q-dat/sub_P301-308.dat
Total quality estimate 0.67
Guinier R_g/I(0) 145.50 229900.00
p(r) R_g/I(0) 145.60 229900.00
Porod Volume 14800000.00
Warning: D_{max}*s_{min} greater than PI.
System Arbitrary Monodisperse
Range 5 109
Setup Point Collimation
D_{max} 435,78
☑ Rmin=0 ☑ Rmax=0
Points 81
Alpha 0,1716

b)
Primus Distance Distribution Wizard
Distance Distribution Analysis
D:/PAPER_IN_WORK/IN_WORK_2020/Mustafina_SiO2/for-figures/N2_CoCl2&SiO2_wo.dat
Total quality estimate 0.66
Guinier R_g/I(0) 131.00 166000.00
p(r) R_g/I(0) 130.90 166000.00
Porod Volume 12200000.00
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Range 6 207
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D_{max} 393,61
☑ Rmin=0 ☑ Rmax=0
Points 75
Alpha 0,4891

c)
Primus Distance Distribution Wizard
Distance Distribution Analysis
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Guinier R_g/I(0) 164.60 84660.00
p(r) R_g/I(0) 164.40 84660.00
Porod Volume 23600000.00
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Range 5 103
Setup Point Collimation
D_{max} 501,38
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Points 79
Alpha 0,5200

d)
Primus Distance Distribution Wizard
Distance Distribution Analysis
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p(r) R_g/I(0) 139.40 60640.00
Porod Volume 13300000.00
Warning: D_{max}*s_{min} greater than PI.
System Arbitrary Monodisperse
Range 5 110
Setup Point Collimation
D_{max} 437,34
☑ Rmin=0 ☑ Rmax=0
Points 82
Alpha 12,1200

e)
Primus Distance Distribution Wizard
Distance Distribution Analysis
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Total quality estimate 0.76
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p(r) R_g/I(0) 139.50 99190.00
Porod Volume 12700000.00
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System Arbitrary Monodisperse
Range 5 110
Setup Point Collimation
D_{max} 433,73
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Points 82
Alpha 0,3924

f)
Primus Distance Distribution Wizard
Distance Distribution Analysis
D:/DATA_IN_WORK/Mustafina_SiO2/SAXS/Must_SiO2/q-dat/sub_N8_1_12-cap.dat
Total quality estimate 0.60
Guinier R_g/I(0) 128.00 183600.00
p(r) R_g/I(0) 127.80 183600.00
Porod Volume 11400000.00
Warning: D_{max}*s_{min} greater than PI.
System Arbitrary Monodisperse
Range 5 154
Setup Point Collimation
D_{max} 363,85
☑ Rmin=0 ☑ Rmax=0
Points 84
Alpha 2,4530

Figure S5. The fitting of experimental SAXS curve (points – experimental data, curves – simulation) and calculated distance distribution function p(r) for: (**a**) w/o Co^{II}@SiO$_2$ (CoCl$_2$ as precursor); (**b**) w/o Co^{II}@SiO$_2$ (Co^{II}(bpy)$_3$ as precursor); **c)** Stöber Co^{II}@SiO$_2$ (CoCl$_2$ as precursor); (**d**) Stöber Co^{II}@SiO$_2$ (Co^{II}(bpy)$_3$ as precursor); (**e**) "empty" Stöber SiO$_2$; (**f**) "empty" w/o SiO$_2$.

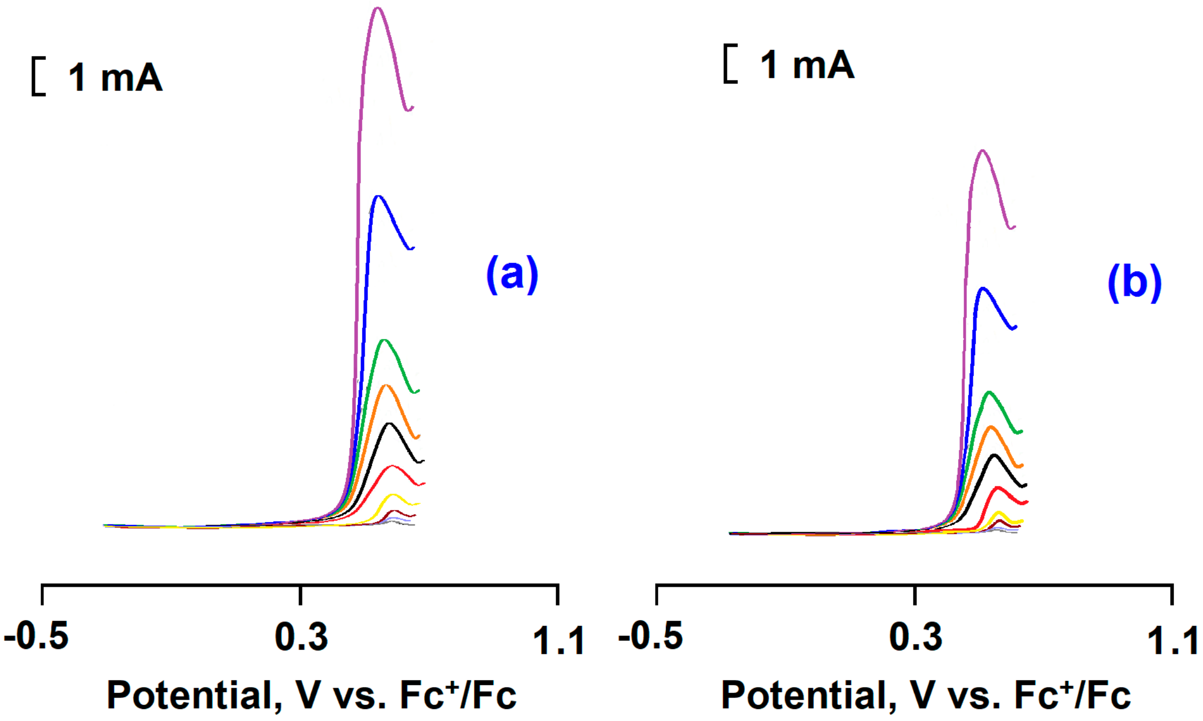

Figure S6. DPV voltammograms for w/o $Co^{II}@SiO_2$ (**a**) and Stöber $Co^{II}@SiO_2$ (**b**) in the absence and in the presence of increasing quantities of Glyphosate (from 0.1 to 80 μmol·L⁻¹: 0.1, 0.2, 0.3, 0.6, 1.2, 2.4, 5.0, 10.0, 20.0, 40.0, 80.0 μM). WE: CPE, H_2O, 10^{-1} M Et_4NBF_4 Potentials vs. Ag/AgCl recalculated to Fc^+/Fc. One-electron electron transfer during the oxidation and reduction of Co (II) is confirmed by the coincidence of the oxidation currents of ferrocene under the same conditions at the same analyte concentration (5×10^{-3} mol·L⁻¹).

The area of the electrode was calculated by the Randles-Sevcik equation:

$$ip = (2.69\cdot10^5) \times n^{3/2} \times A\ D^{1/2} \times C \times v^{1/2} \qquad (1)$$

where n is the number of moles of electrons transferred in the reaction, ip is peak current, A is the area of the electrode, C is the analyte concentration (in moles/cm^3), D is the diffusion coefficient, and v is the scan rate of the applied potential. A = 2.0008 mm^2