

Supporting Information for

## **Fumed Silica-Derived CoOx@SiO<sub>2</sub> Composites for Catalytic Reduction of 2-Nitrophenol**

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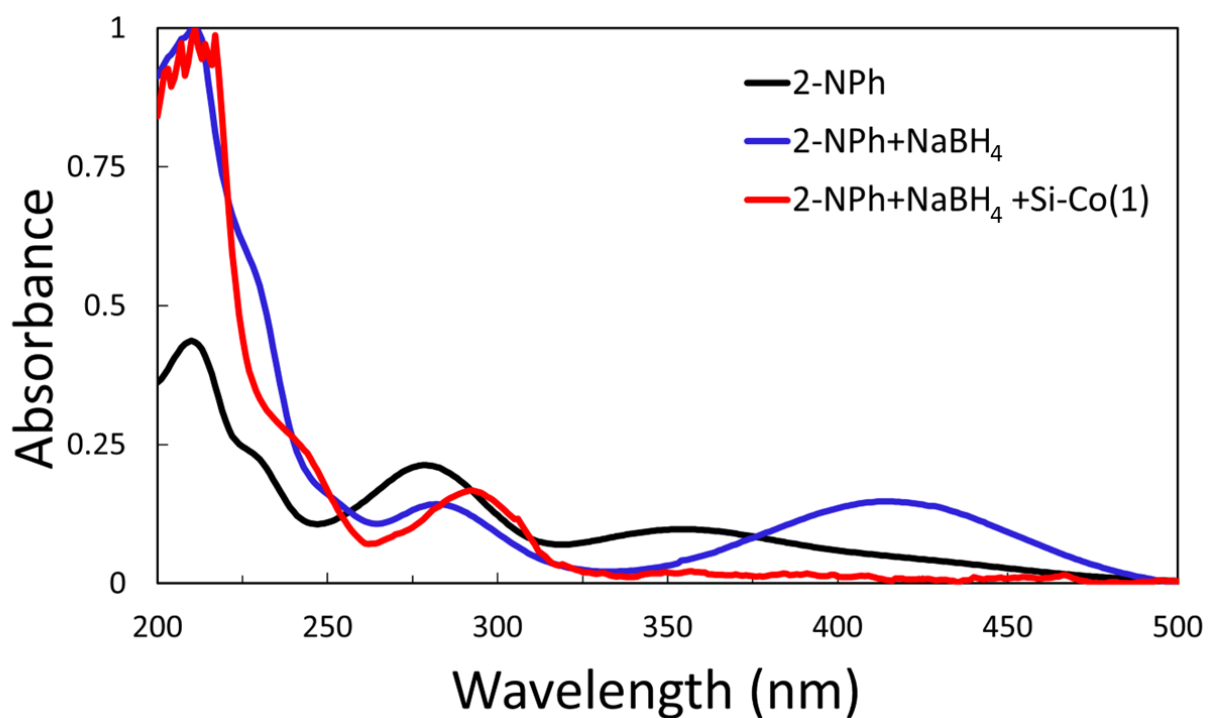


Figure S1. UV-Vis spectra taken from an aqueous solution of 2-NPh before NaBH<sub>4</sub> addition (black), after NaBH<sub>4</sub> addition (blue), and 3 min after addition of Si-Co(1) and NaBH<sub>4</sub> (red).

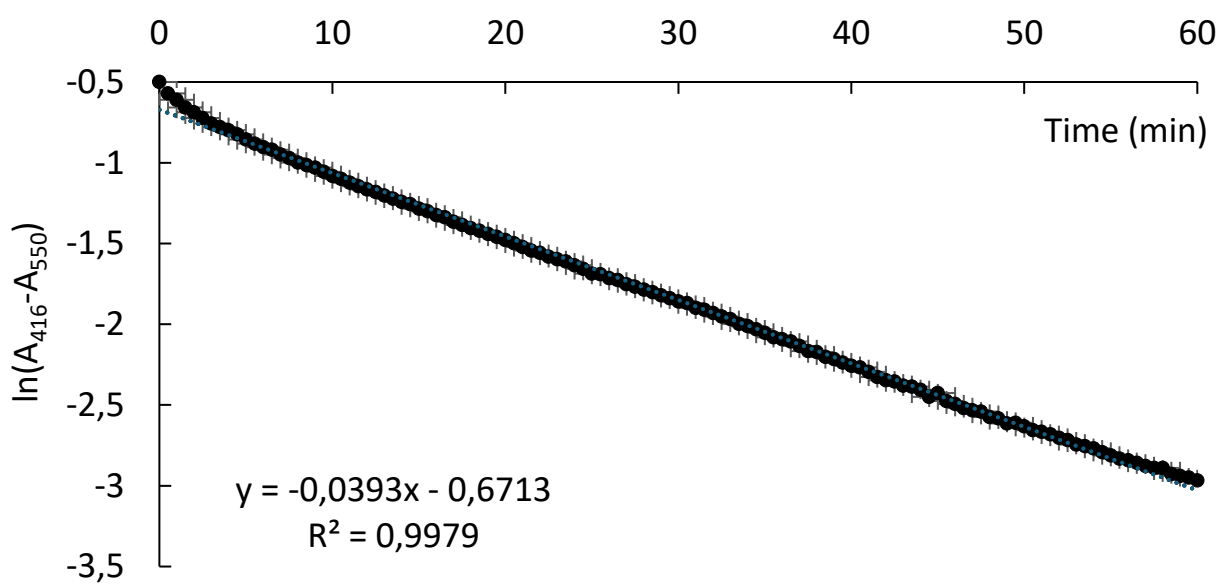


Figure S2. Reaction kinetics analysis for the Si-Co(1)-catalyzed reduction of 2-NPh (0.5 mM) with NaBH<sub>4</sub> (5.0 mM).

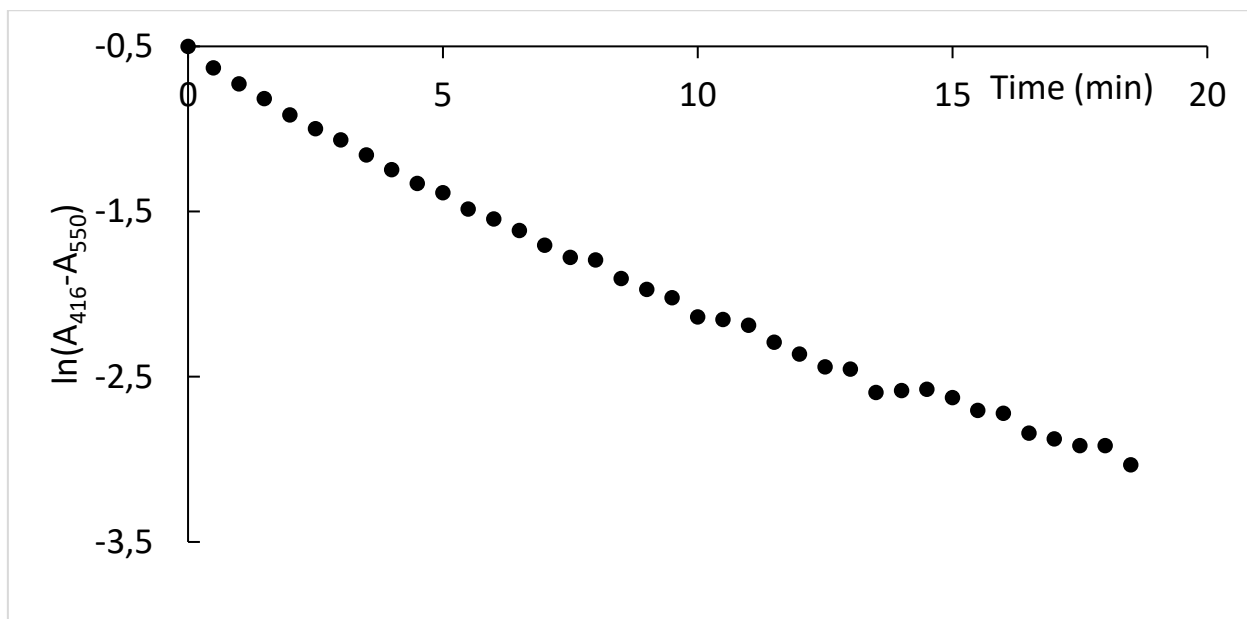


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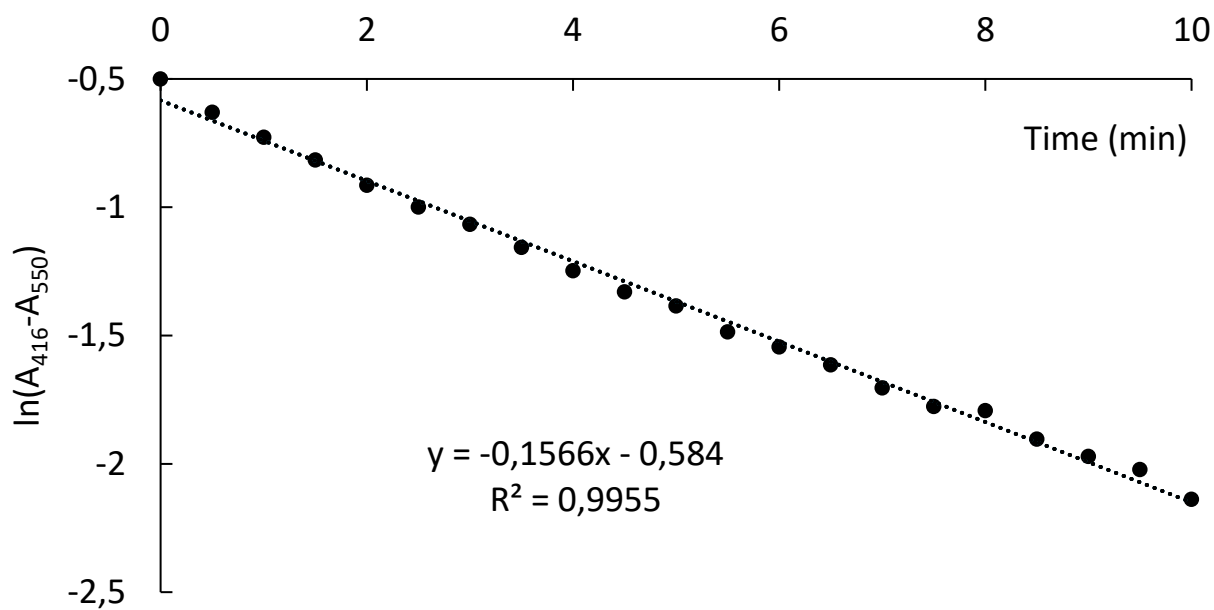


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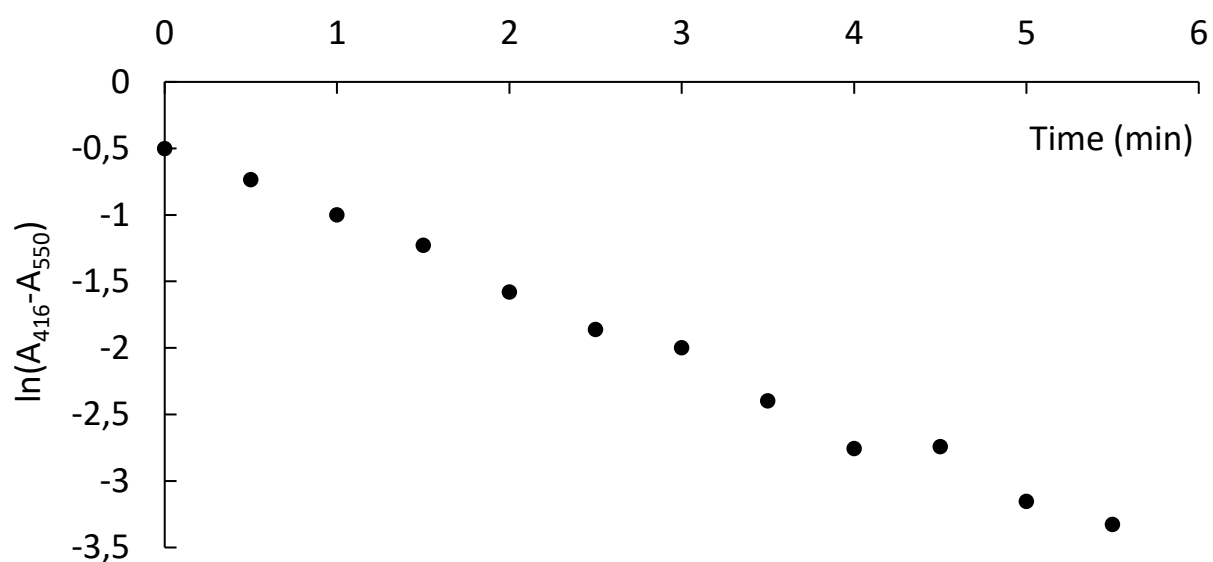


Figure S5. Reaction kinetics analysis for the Si-Co(1)-catalyzed reduction of 2-NPh (0.5 mM) with NaBH<sub>4</sub> (0.25 M).

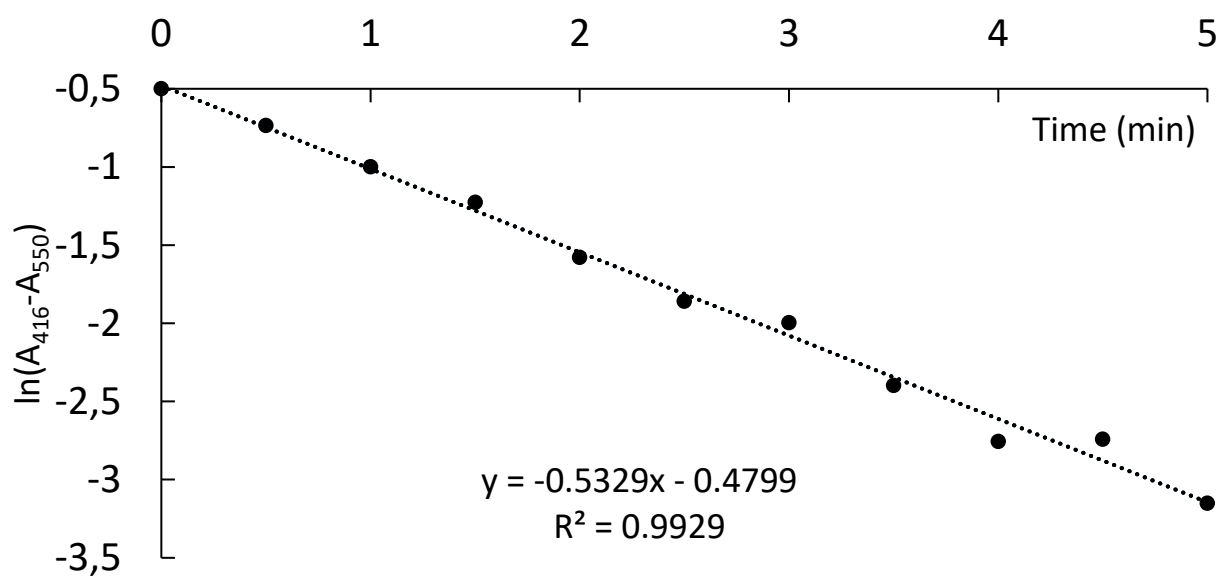


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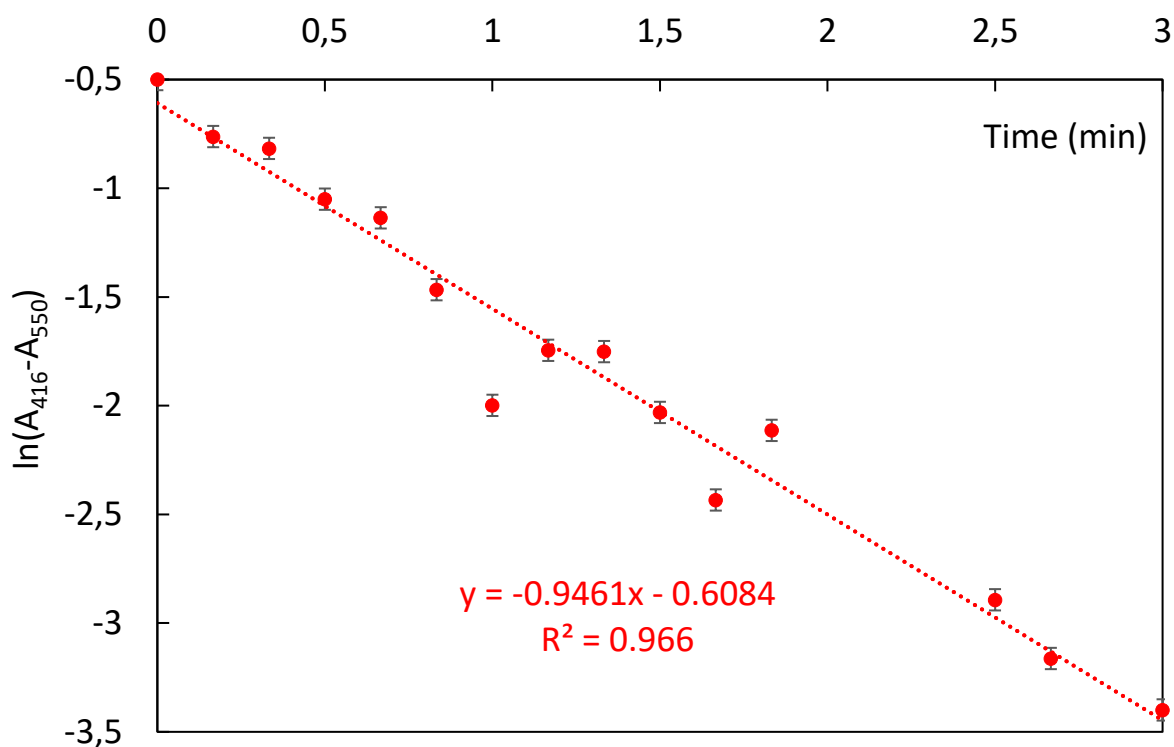


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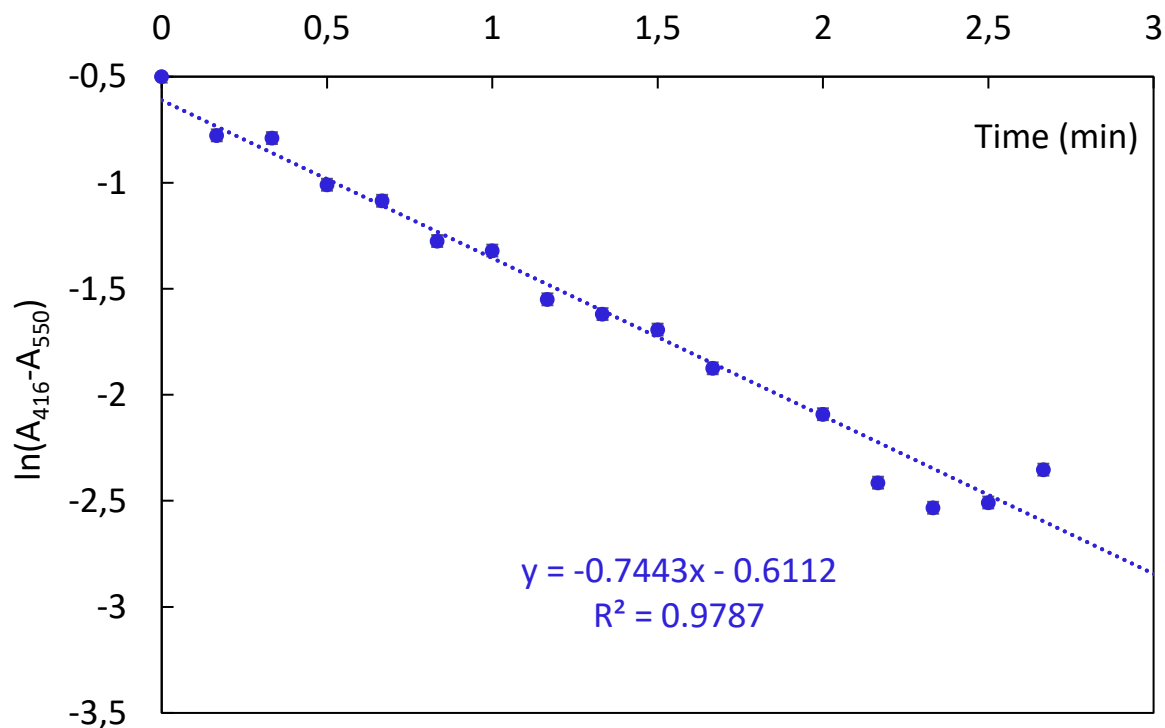


Figure S8. Reaction kinetics analysis with linear regression analysis for the Si-Co(2)-catalyzed reduction of 2-NPh (0.15 mM) with NaBH<sub>4</sub> (0.15 M).

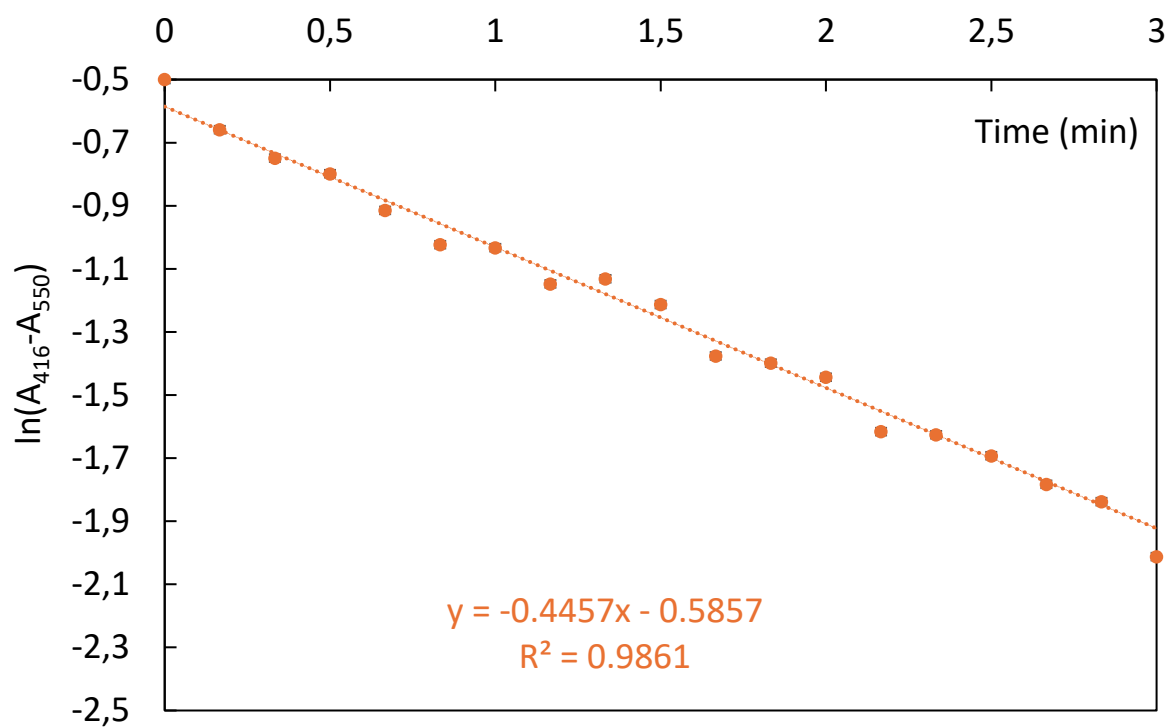


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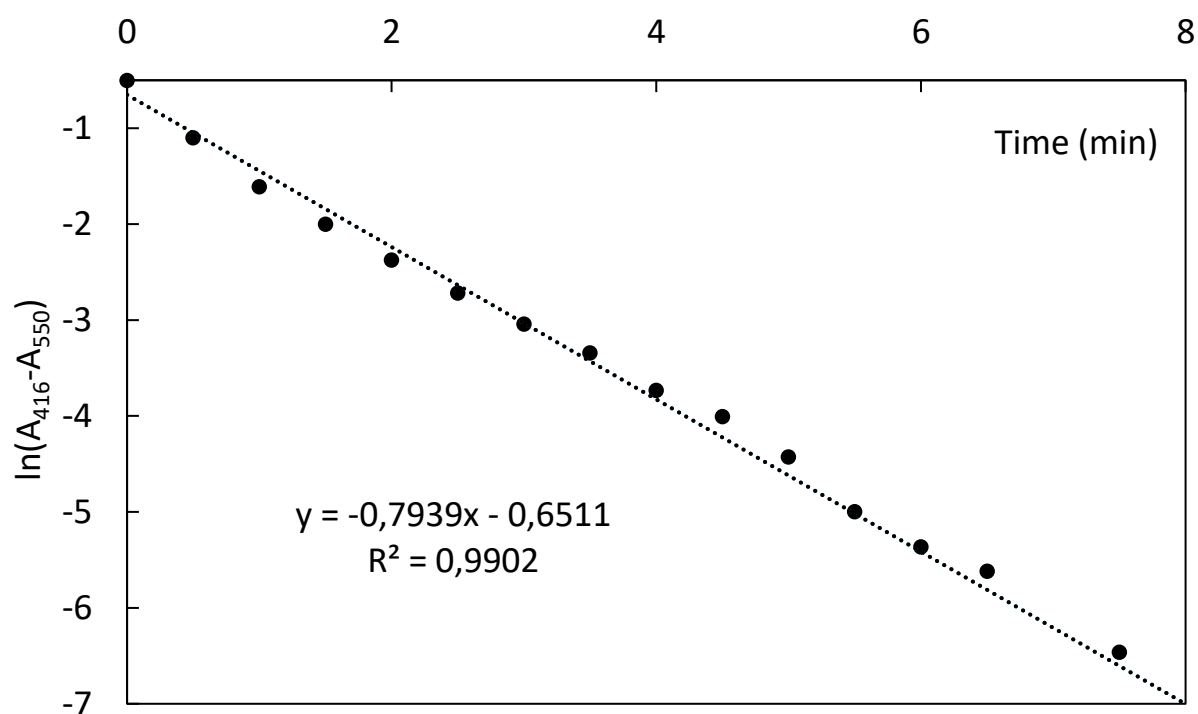


Figure S10. Reaction kinetics analysis with linear regression analysis for the cobalt (II) acetate (30 mol% Co) catalyzed reduction of 2-NPh (0.5 mM) with NaBH<sub>4</sub> (50 mM).

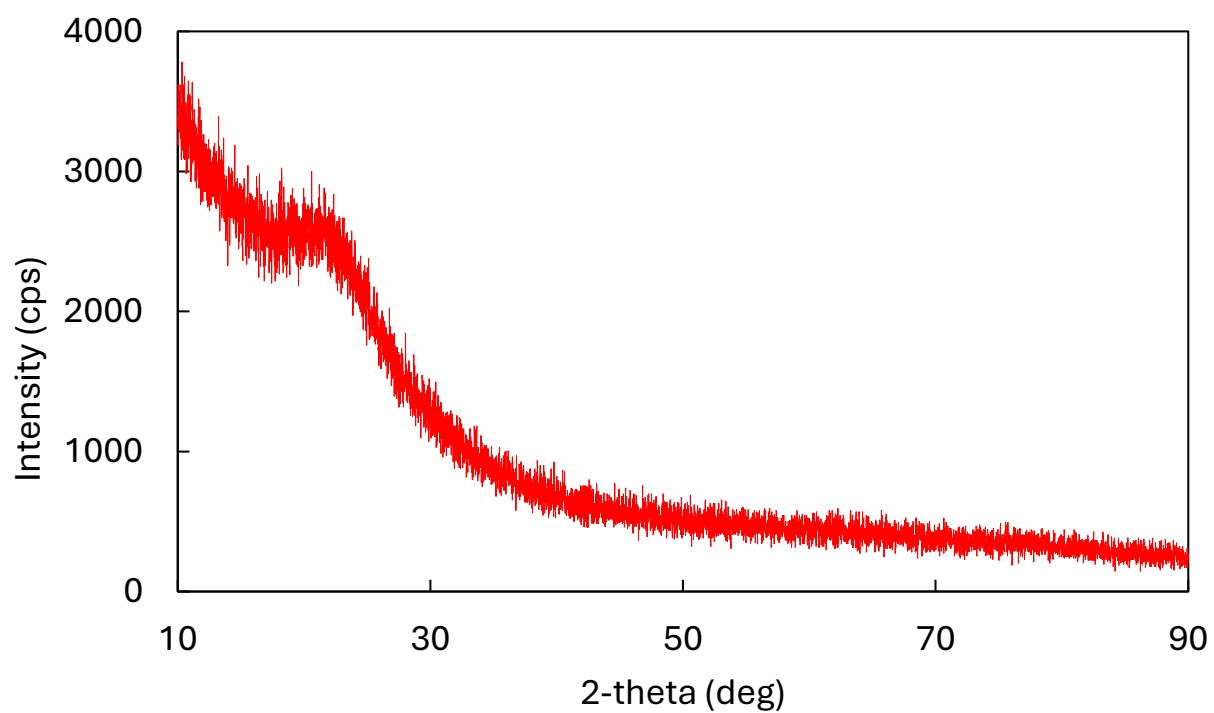


Figure S11. Powder XRD spectrum for Si-Co(1).

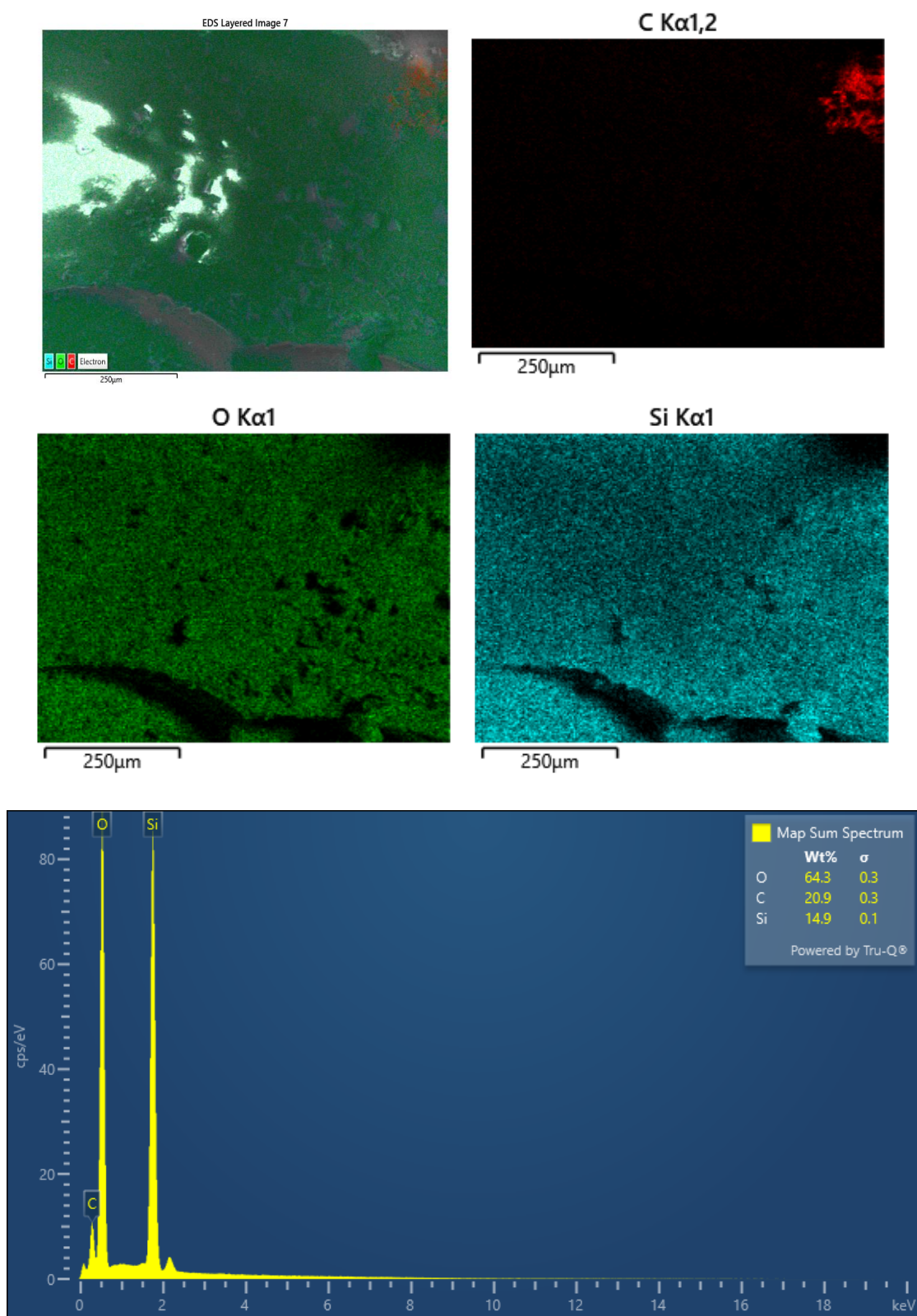


Figure S12. SEM-EDS analysis for TES-SiO<sub>2</sub>.

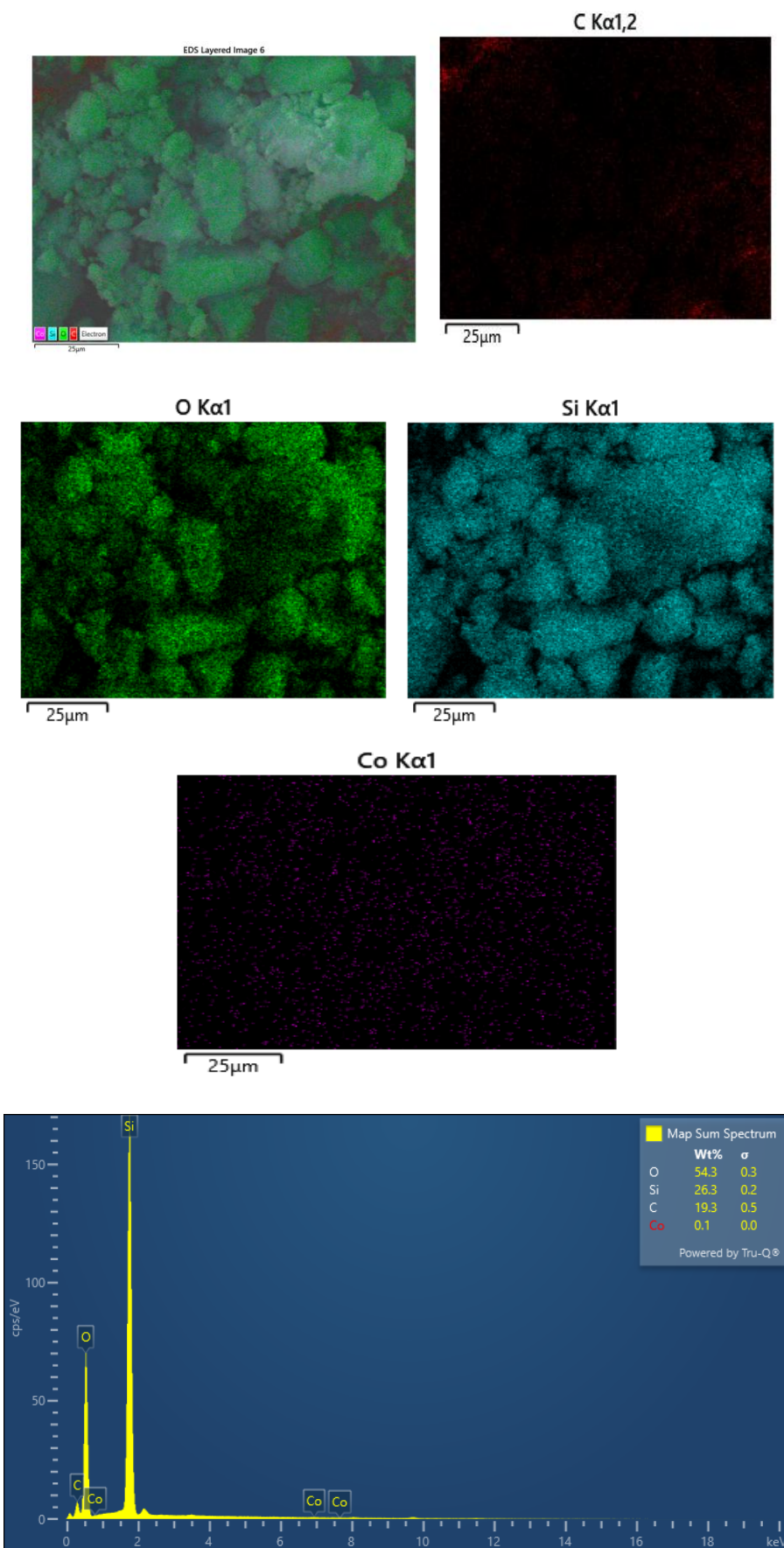


Figure S13. SEM-EDS analysis for Si-Co(1).

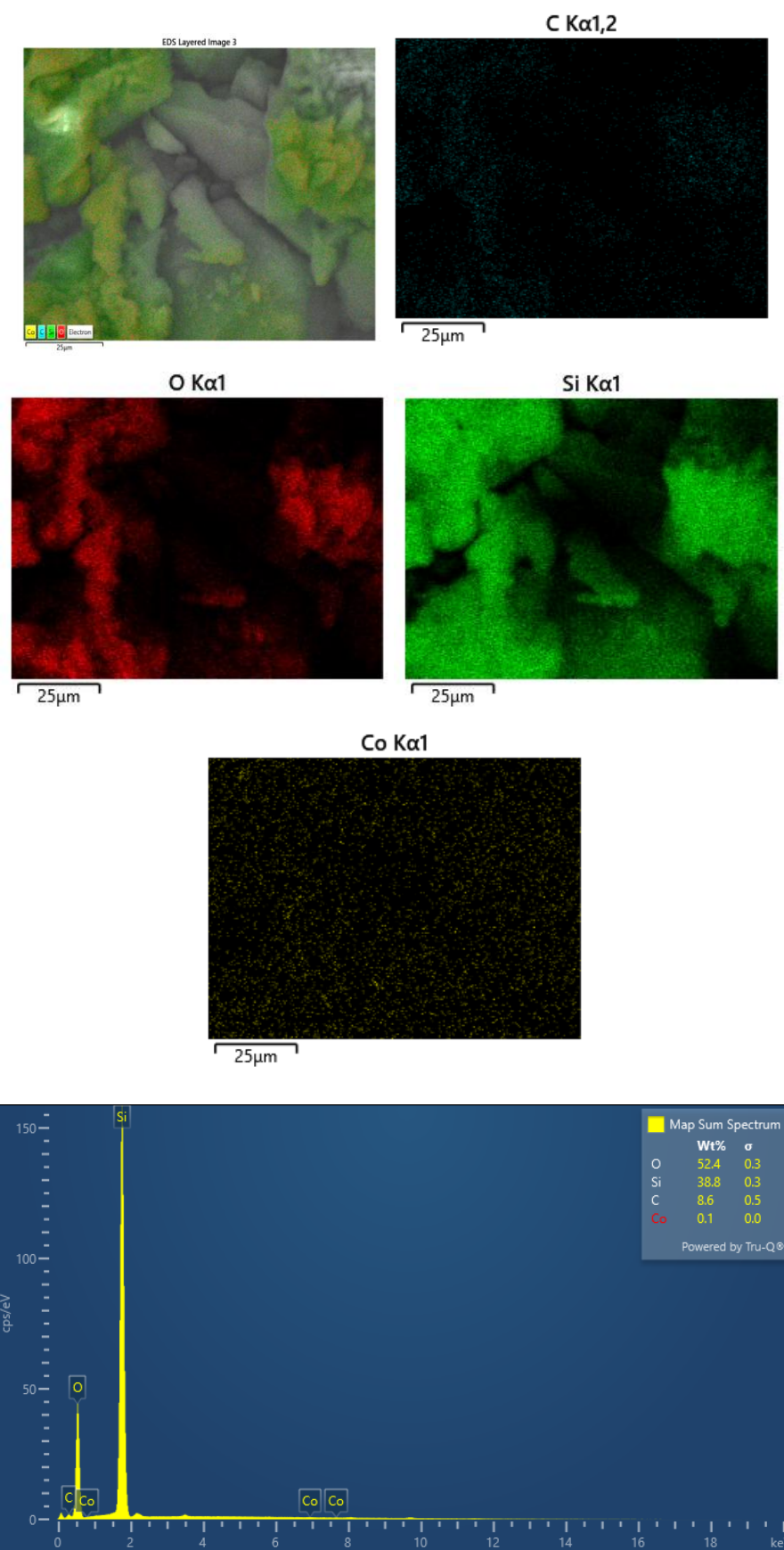


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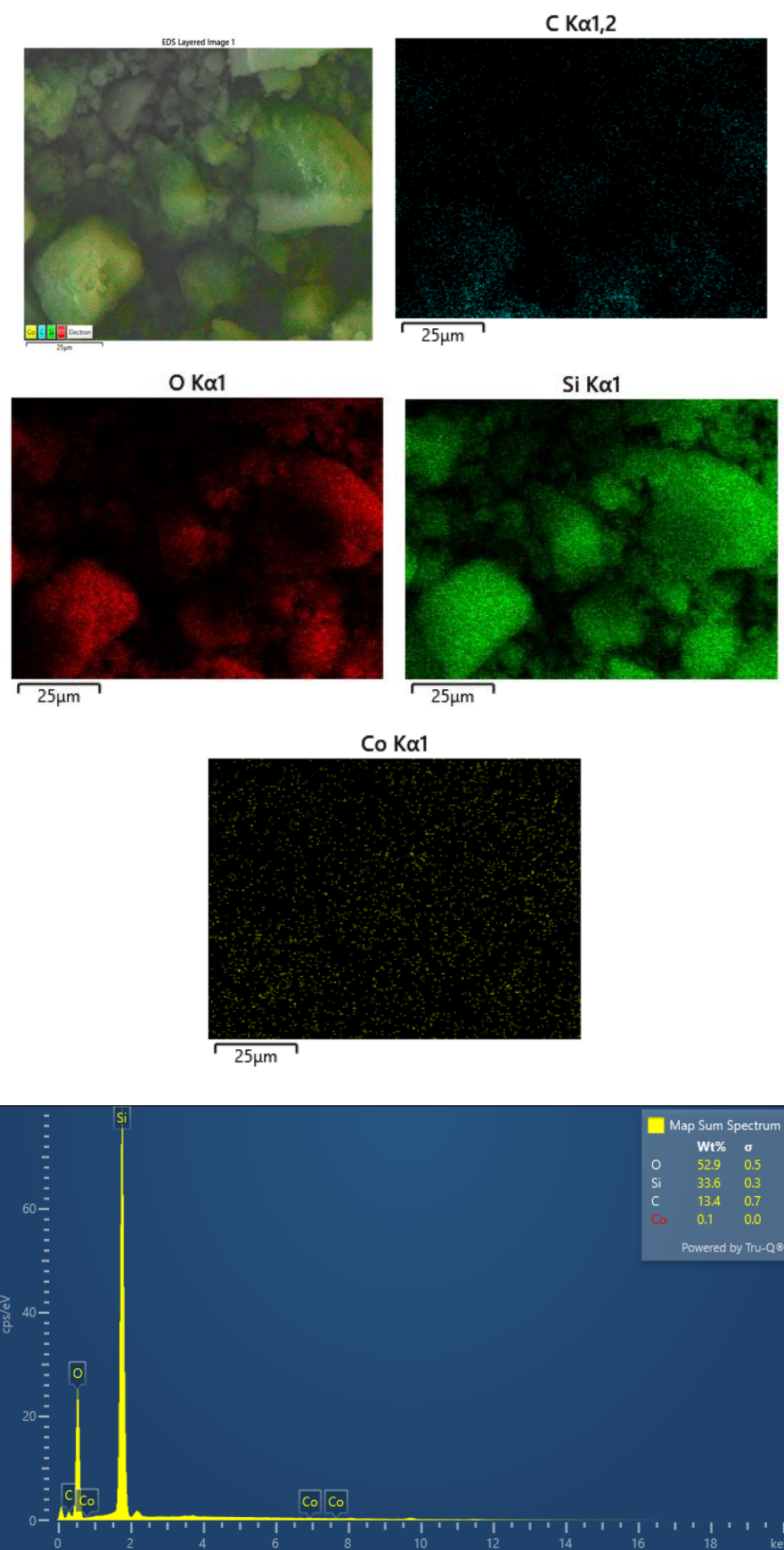


Figure S15. SEM-EDS analysis for Si-Co(3).

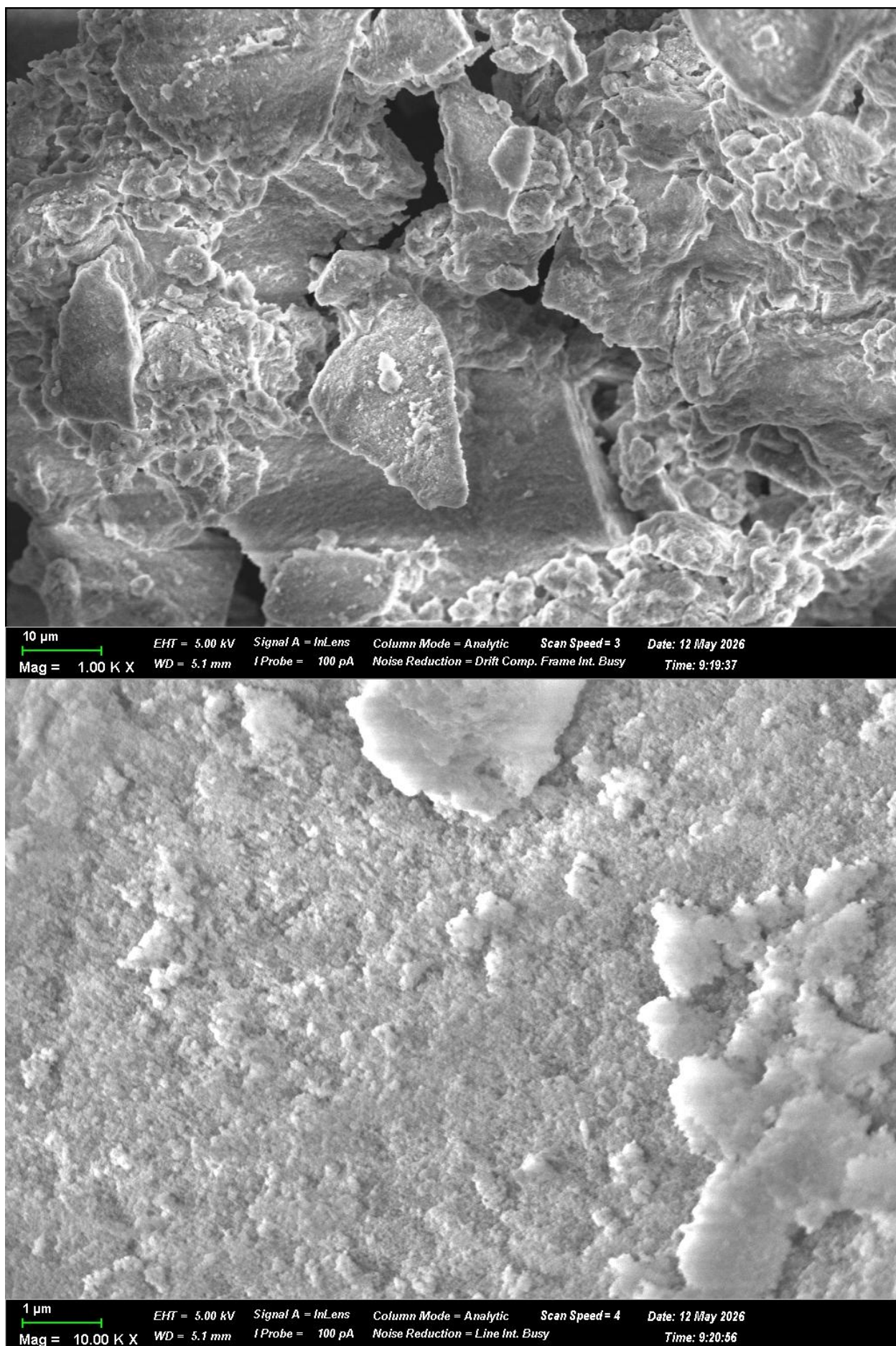


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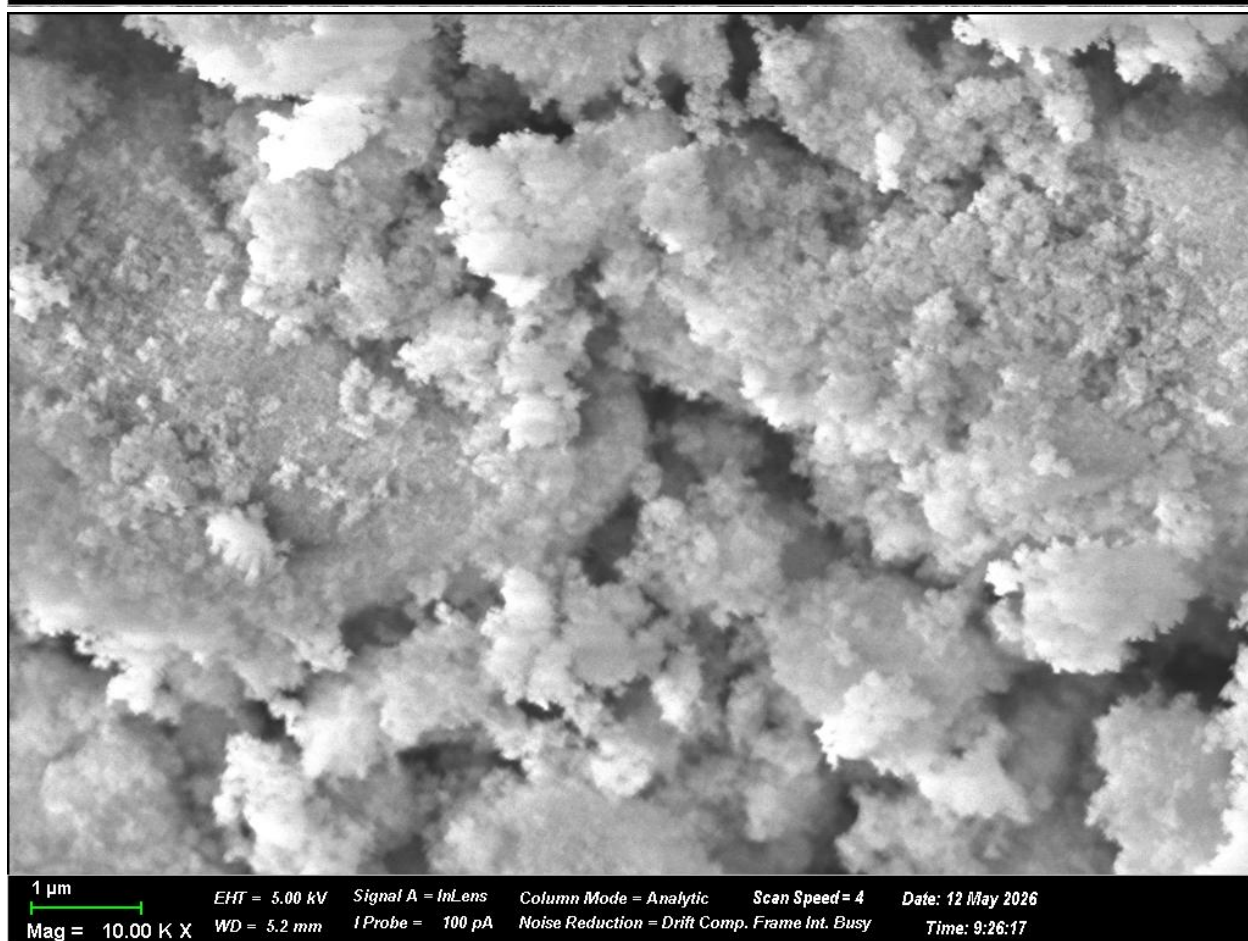
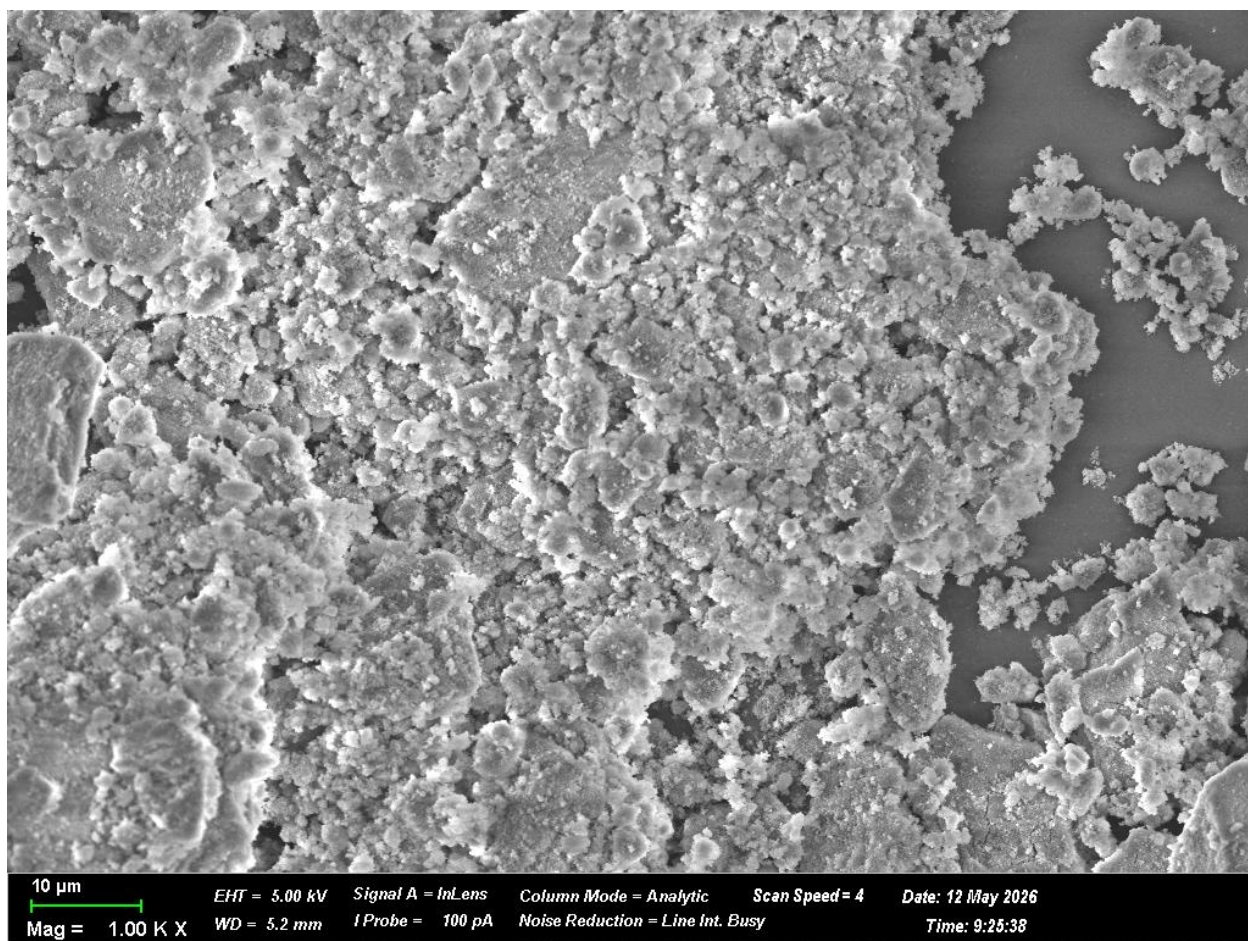


Figure S17. SEM images of Si-Co(1).

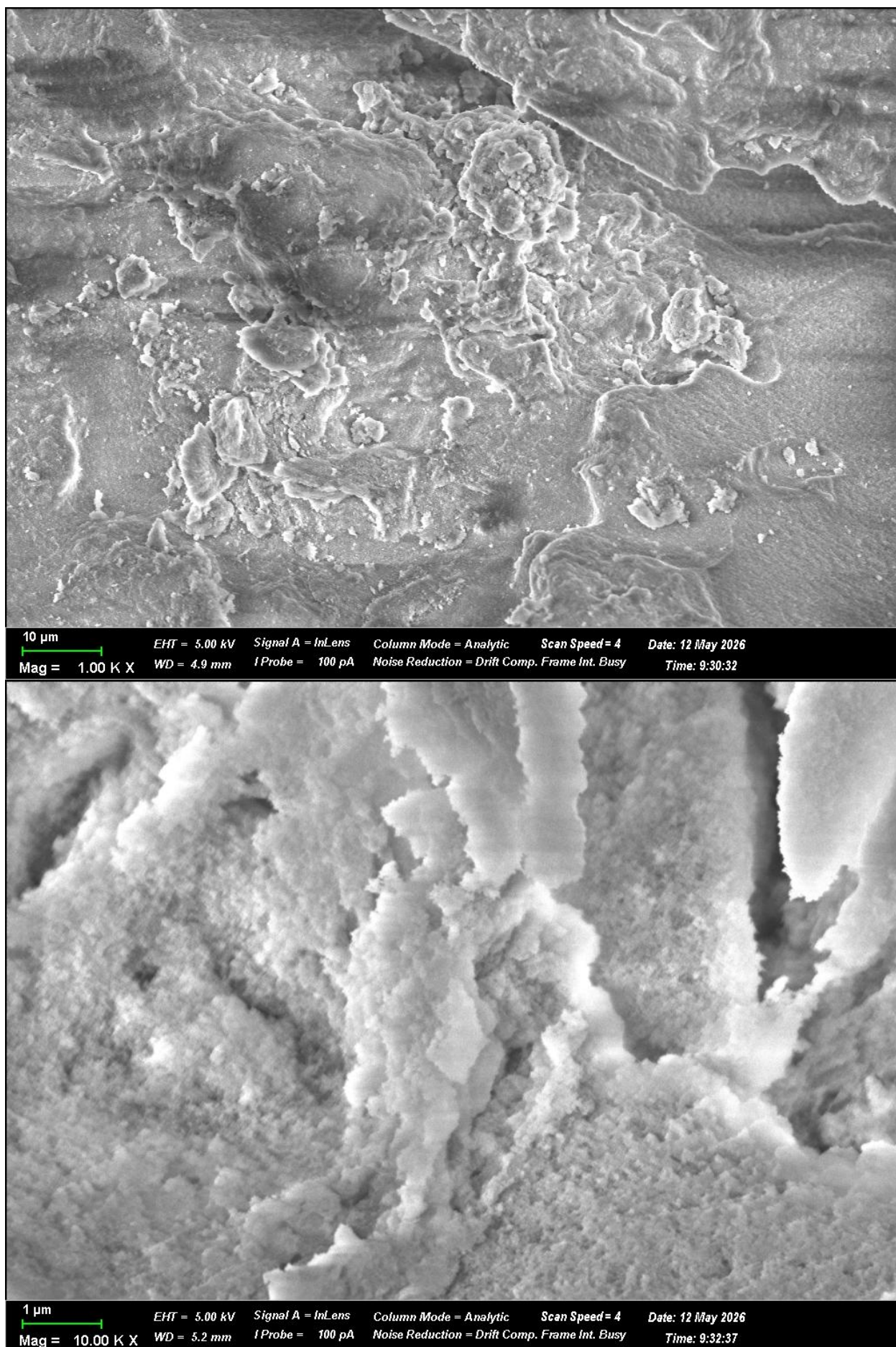


Figure S18. SEM images of Si-Co(2).

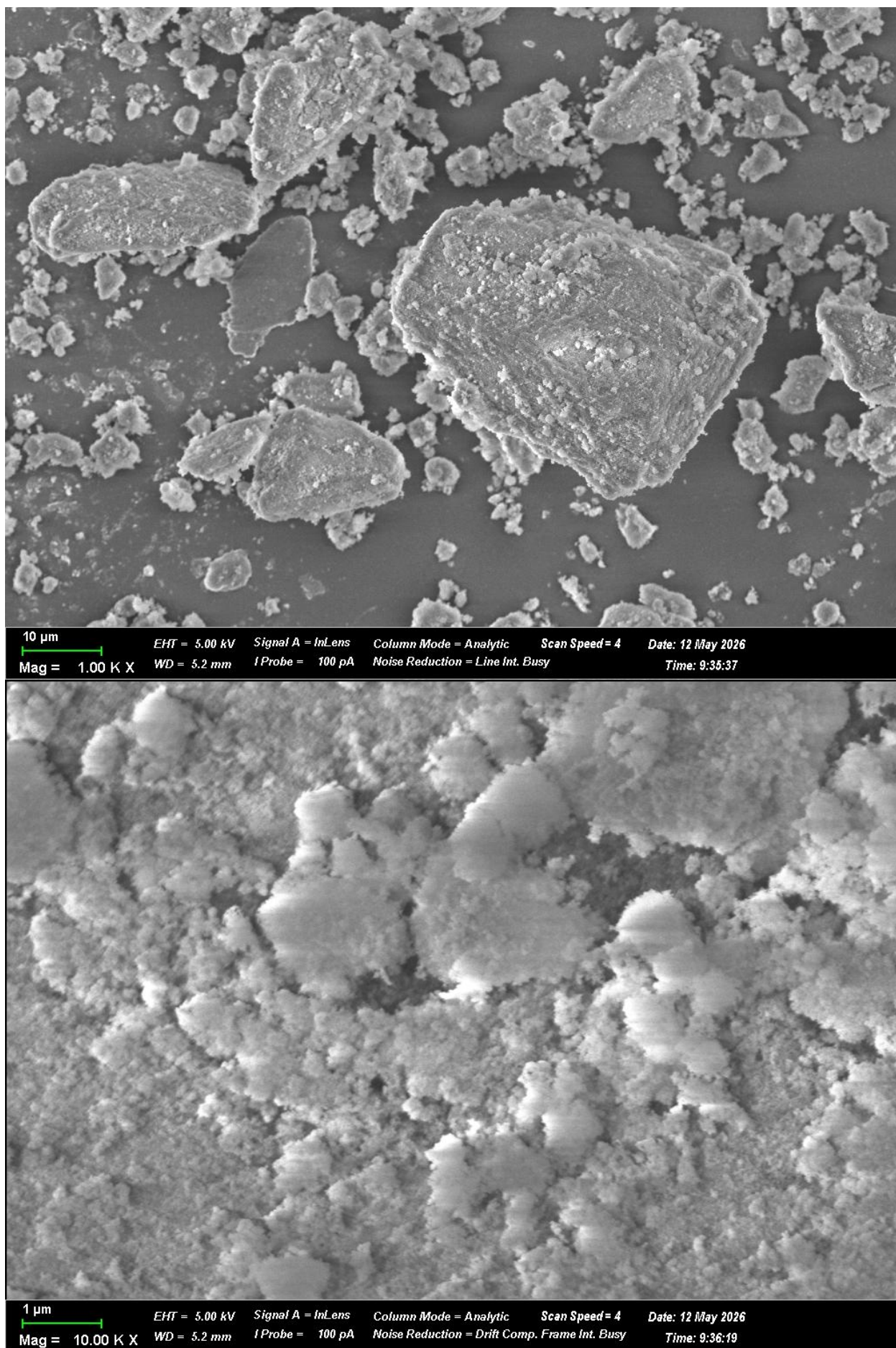


Figure S19. SEM images of Si-Co(3).

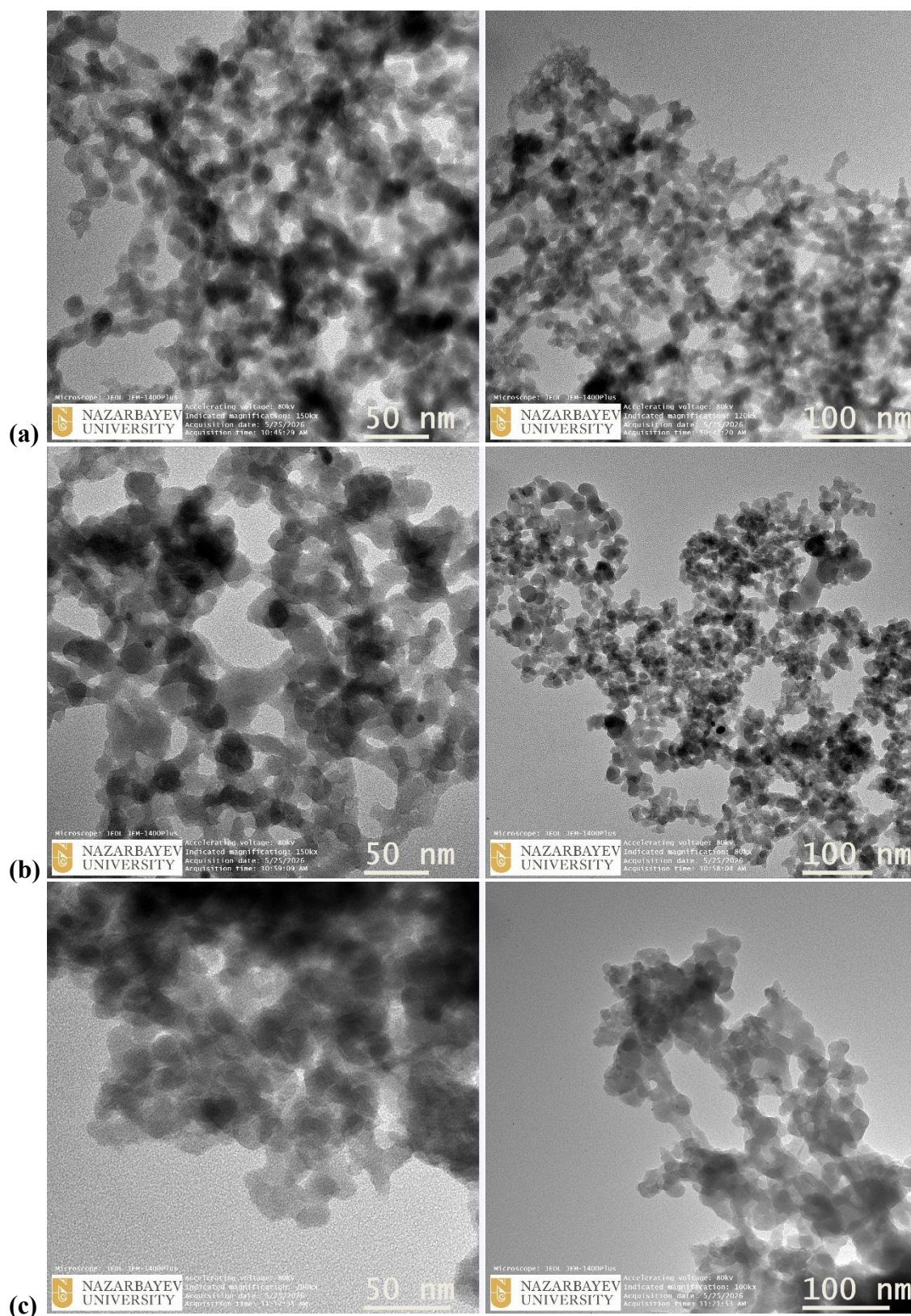


Figure S20. TEM images of fumed  $\text{SiO}_2$  (a), TES- $\text{SiO}_2$  (b), and Si-Co(1) (c)

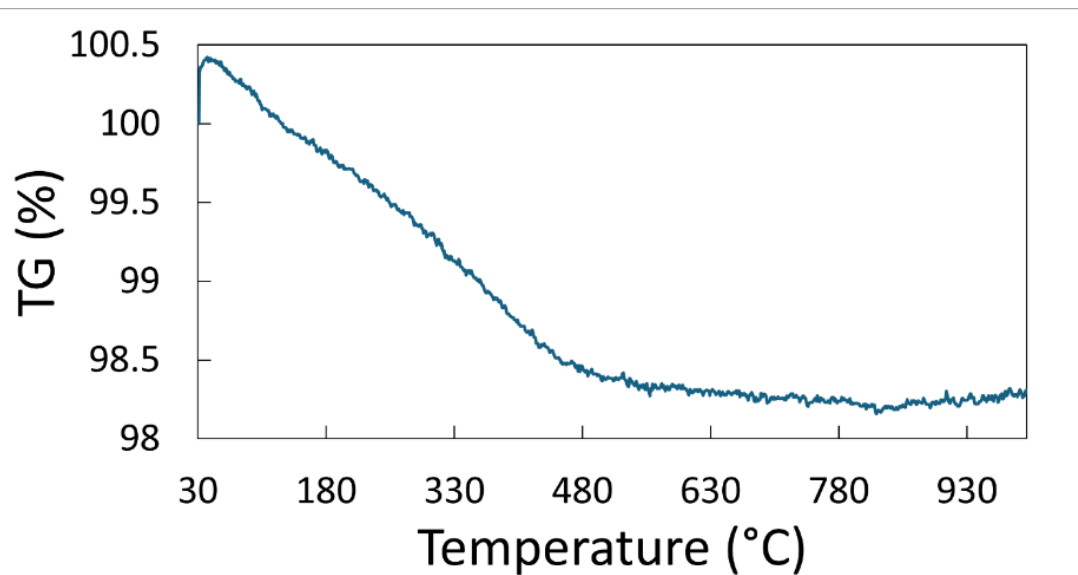


Figure S21. TGA curve for TES-SiO<sub>2</sub>.

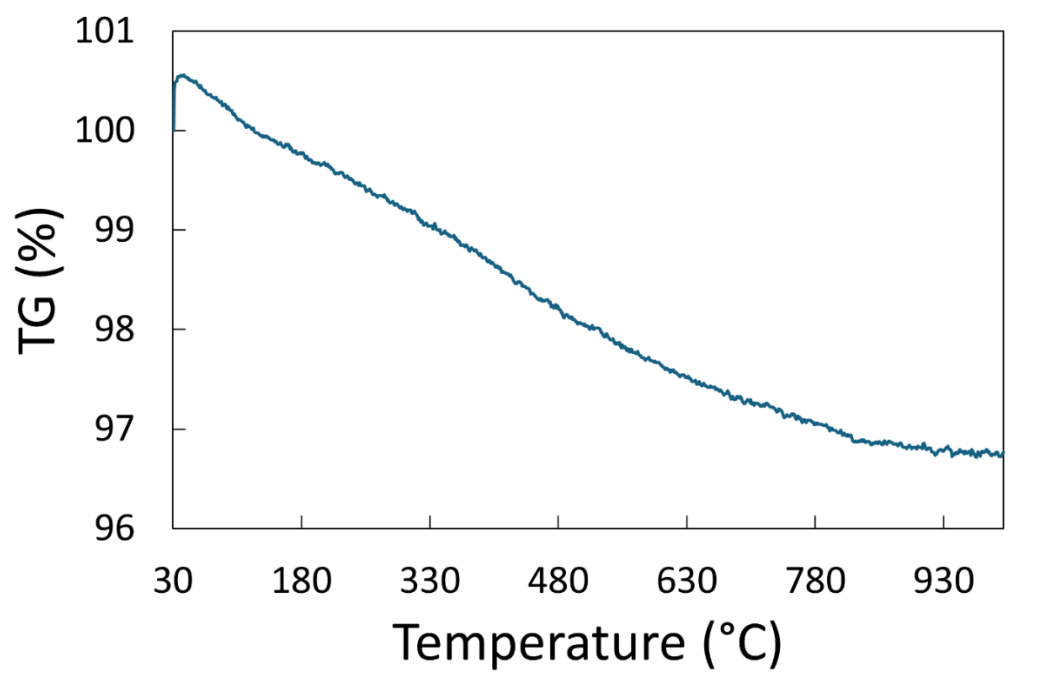


Figure S22. TGA curve for Si-Co(1).

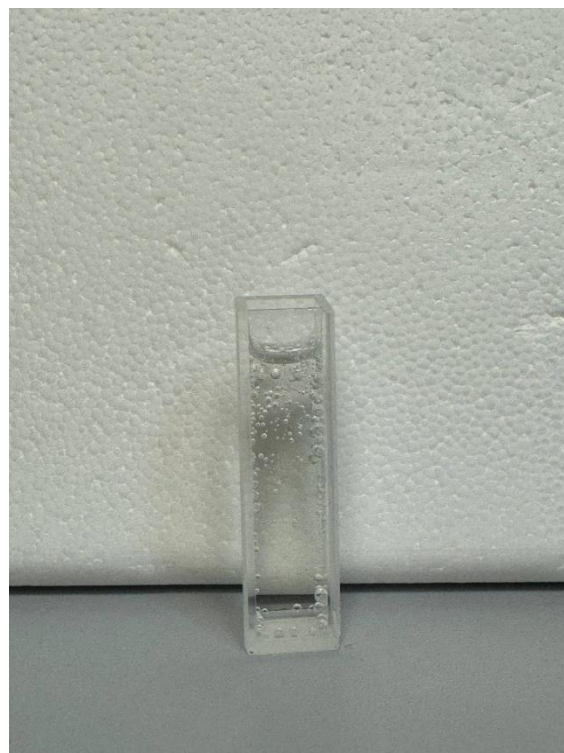
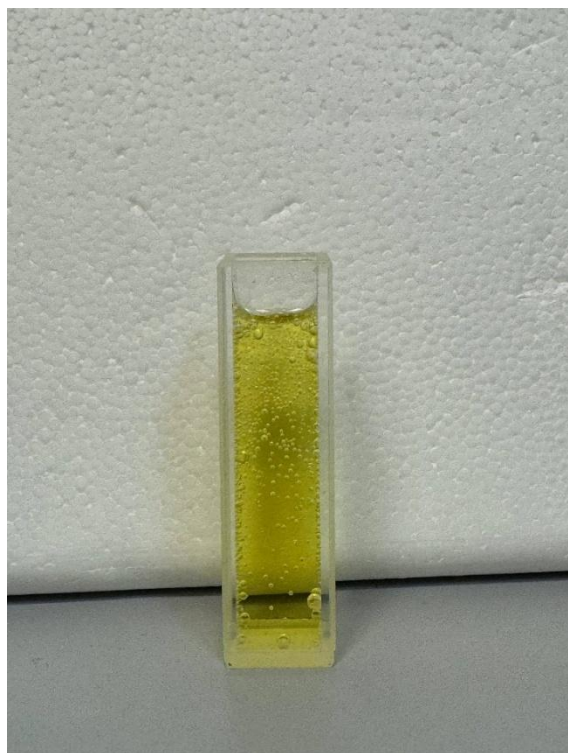


Figure S23. Reaction mixture of 2-NPh with  $\text{NaBH}_4$  and cobalt (II) acetate as catalysts (30 mol% Co) at the beginning (left) and the end (after 8 min at room temperature) of the reaction (right).

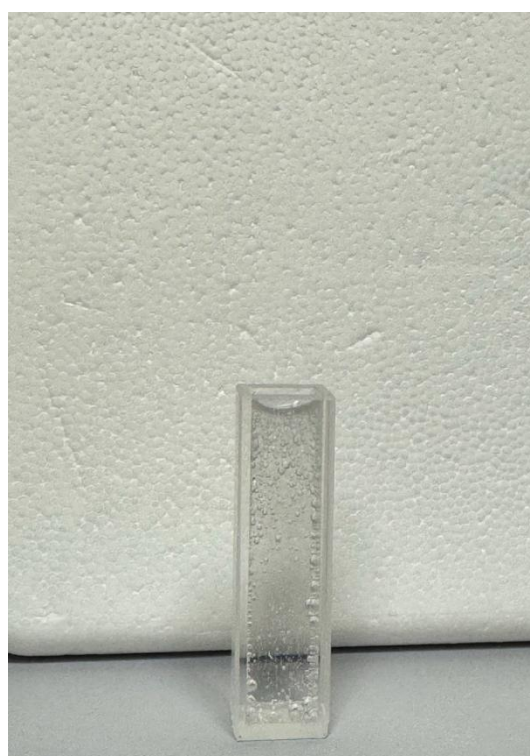
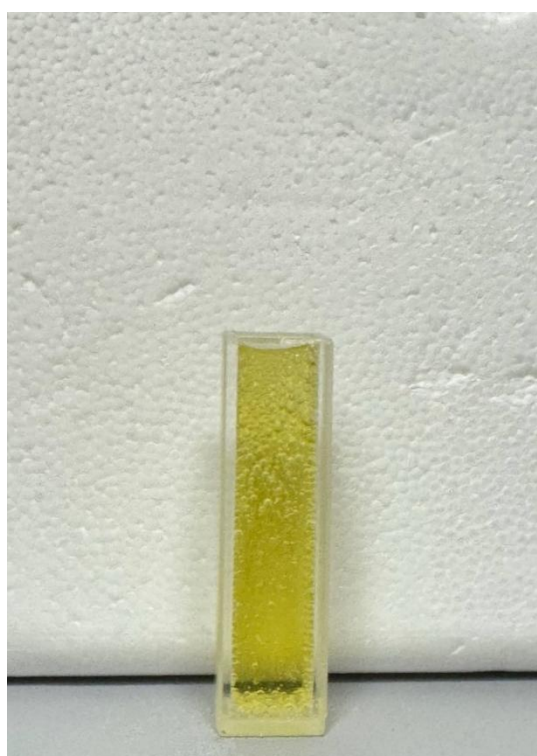


Figure S24. Reaction mixture of 2-NPh with  $\text{NaBH}_4$  and Si-Co(1) as catalysts at the beginning (left) and the end (after 3 min at room temperature) of the reaction (right).

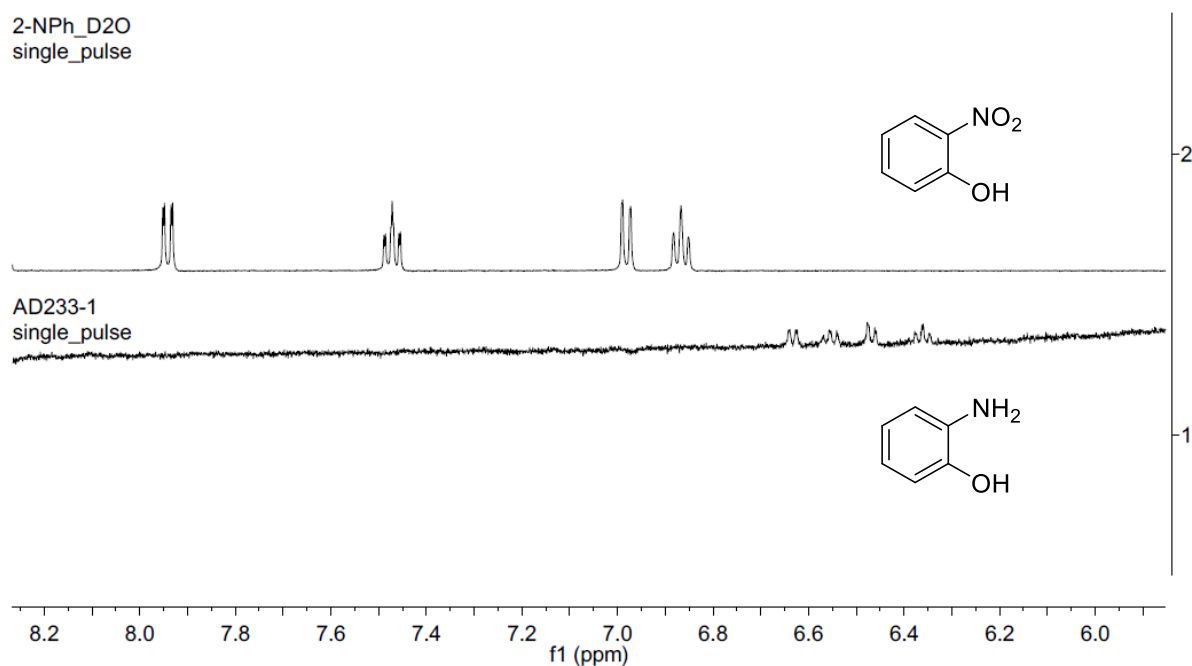


Figure S25.  $^1\text{H}$ -NMR spectra (in  $\text{D}_2\text{O}$ ) of 2-NPh (top) and the solid residue after Si-Co(1)-catalyzed reduction of 2-NPh with  $\text{NaBH}_4$ , showing complete conversion of 2-NPh and formation of 2-Aph (bottom).

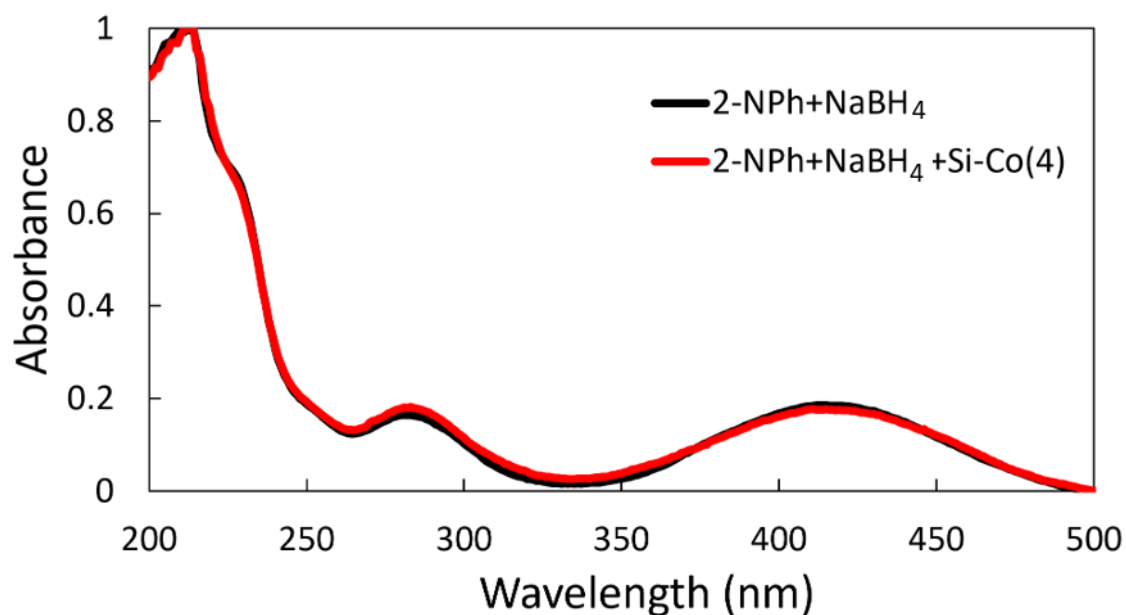


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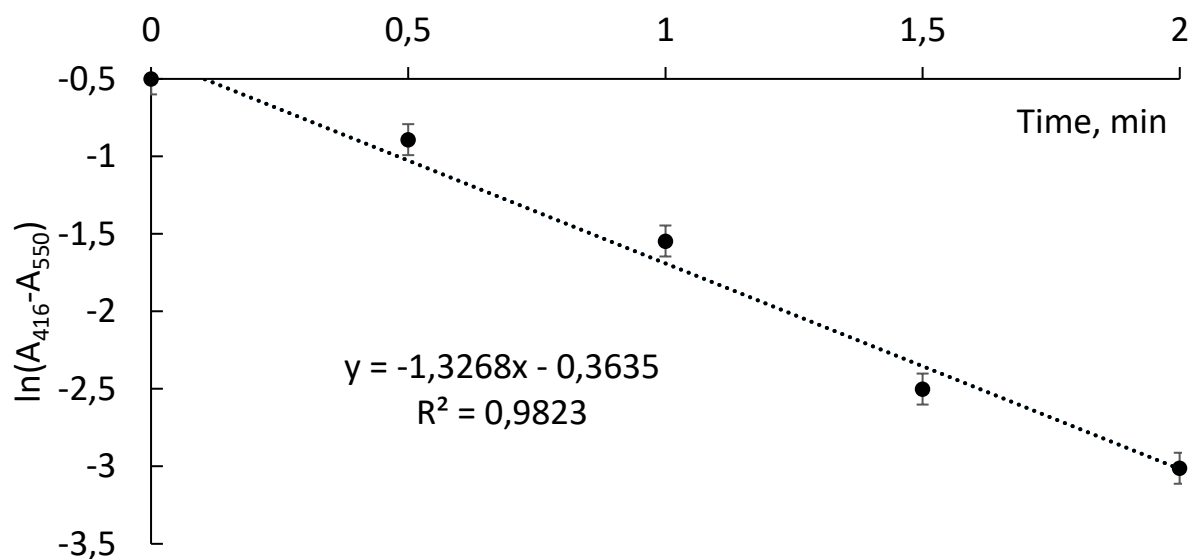


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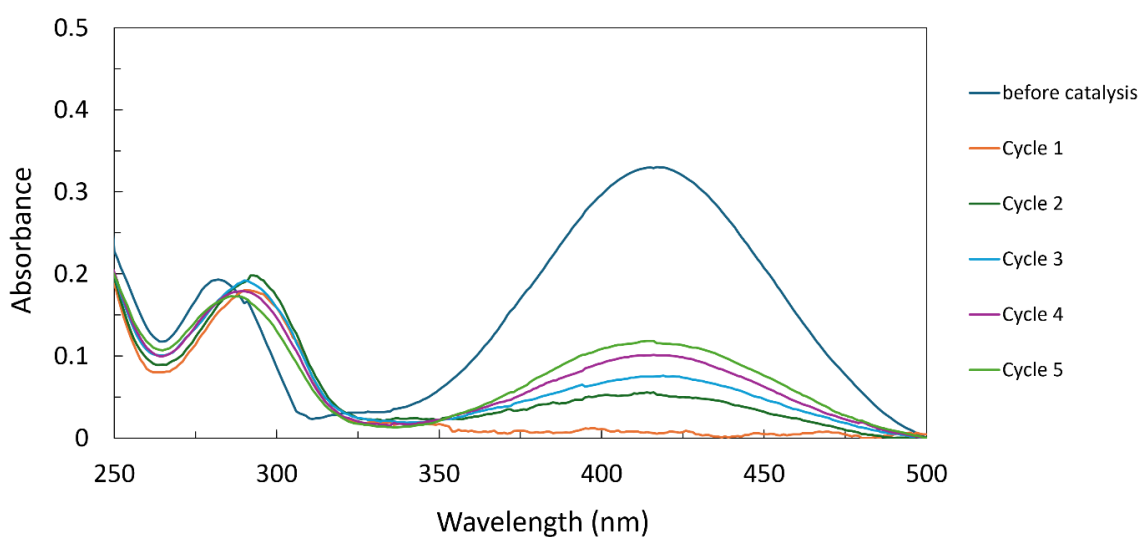
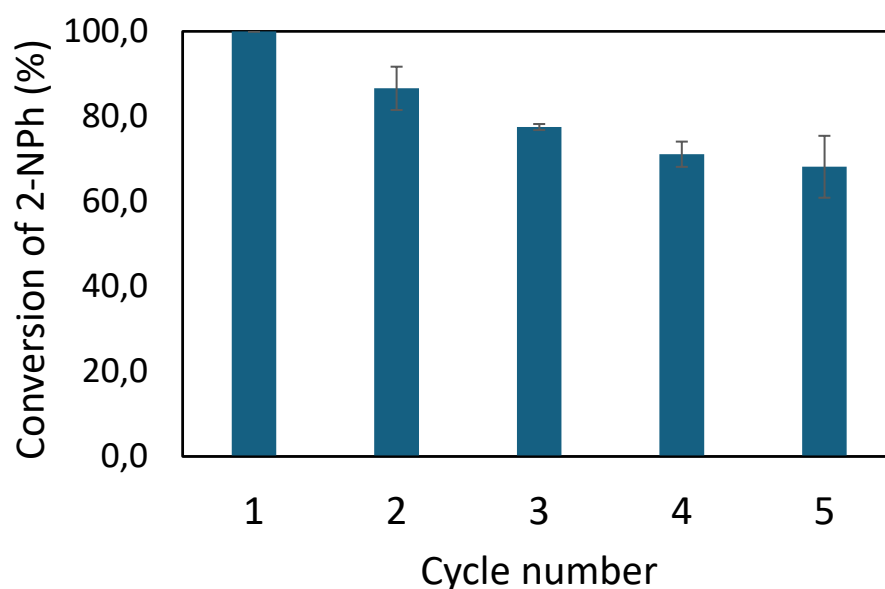


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