

In situ Investigation of the Formation Mechanism of α -Bi₂Rh Nanoparticles in Polyol Reductions

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Supporting Information

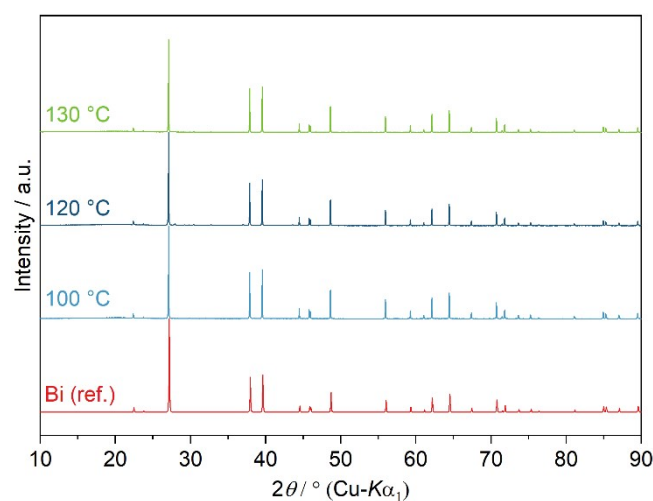


Figure S1. PXRD patterns of solid reaction products obtained by heating the supernatant obtained from the reaction of $\text{Bi}(\text{NO}_3)_3$ and $\text{Rh}_2(\text{OAc})_4$ with added NaOH to 250 °C for 10 min. Bi (ref.) is the calculated diffraction pattern based on the crystal structure of Bi (ICSD entry CSD-64703).

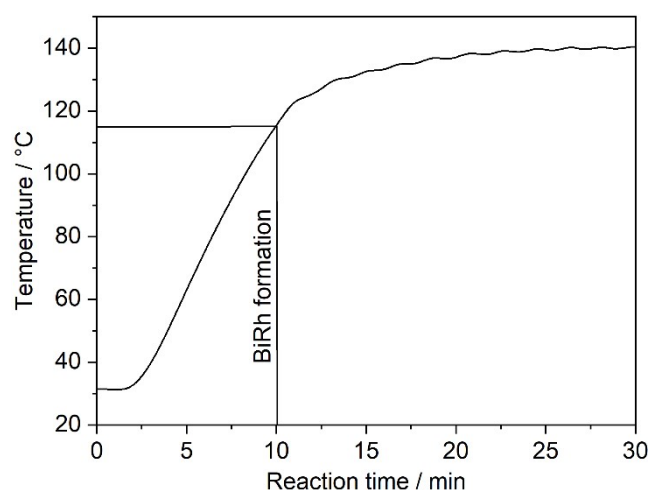


Figure S2. Temperature course throughout the reaction with an approximate suggestion of the BiRh formation point.

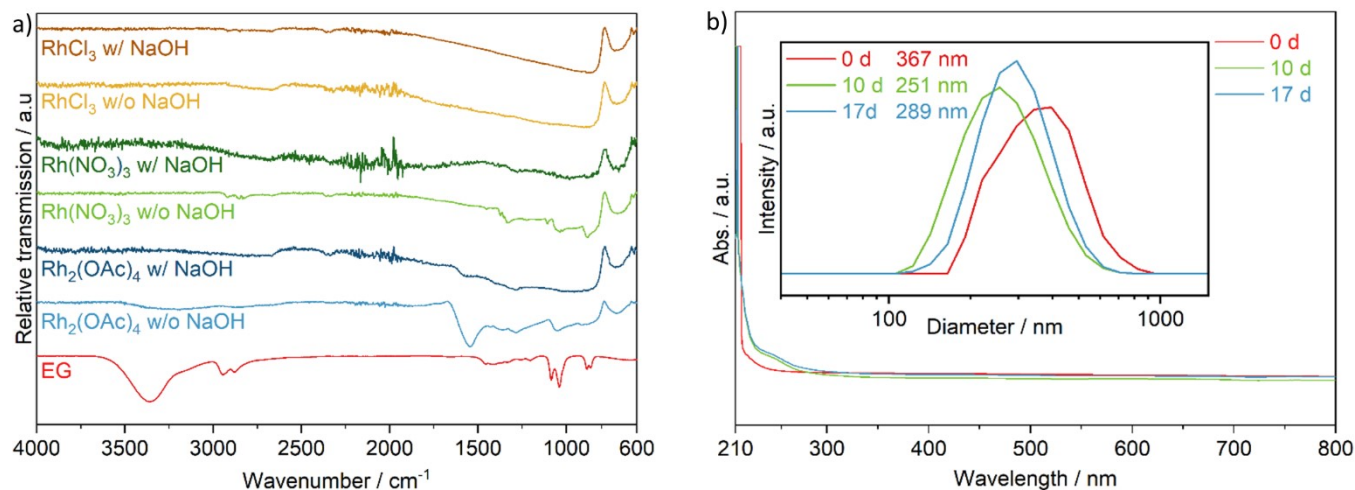


Figure S3. a) FT-IR spectra of the final products obtained by reacting Bi(NO₃)₃ with different rhodium salts under neutral and alkaline conditions. b) UV-Vis spectrum and DLS measurement (inset) of Bi₂Rh re-dispersed in EG (0.04 mg/mL) after dispersion (0 d), 10 days and 17 days.

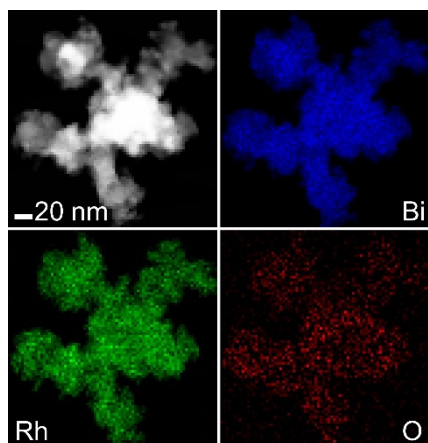


Figure S4. Elemental mapping of an intermediate obtained from the reaction of Bi(NO₃)₃ and Rh₂(OAc)₄ with added NaOH at 130 °C after 10 min reaction time.

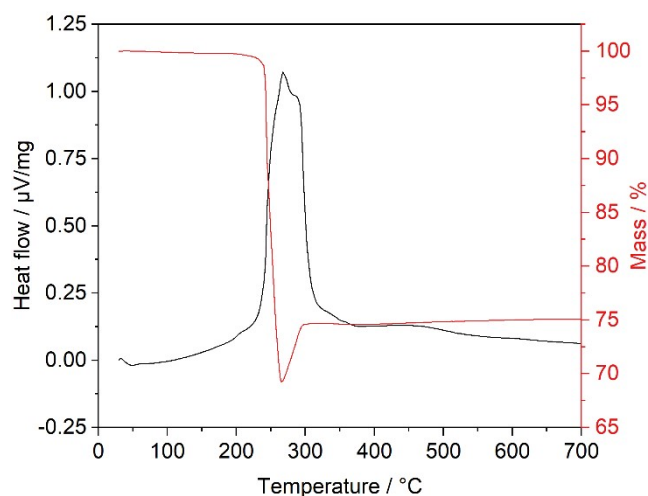


Figure S5. DTA-TG measurement of Bi₃(C₂H₄O₂)₄(NO₃).

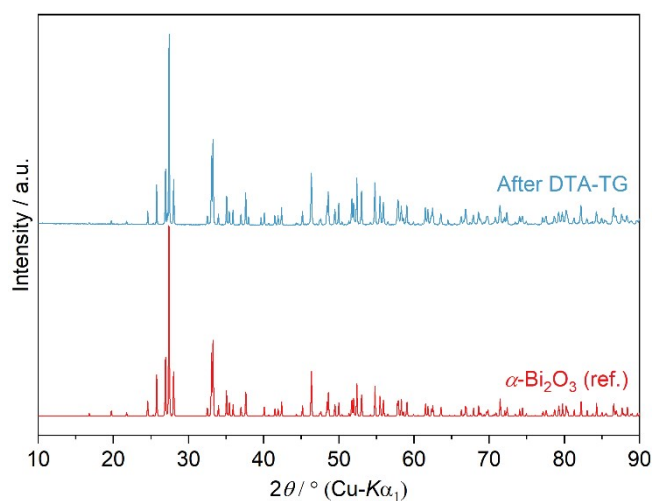


Figure S6. Powder pattern of the powder obtained after combustion of the bismuth glycolate during DTA-TG.

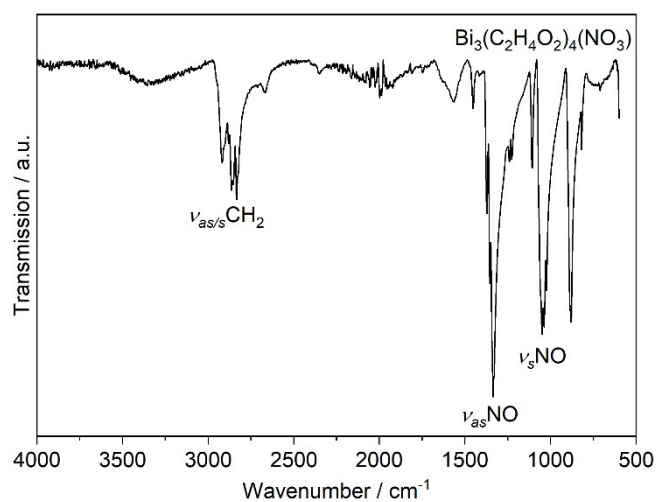


Figure S7. FT-IR spectrum of the obtained bismuth glycolate from pure $\text{Bi}(\text{NO}_3)_3$ solution.

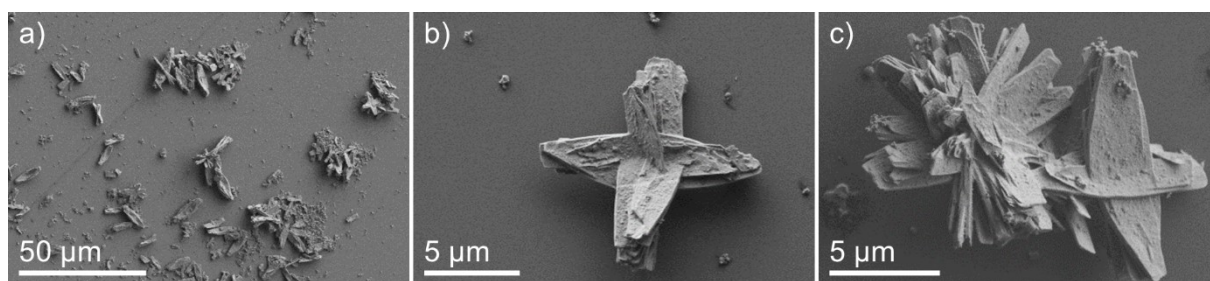


Figure S8. SEM images of particles obtained from the reaction of $\text{Bi}(\text{NO}_3)_3$ and $\text{Rh}(\text{NO}_3)_3$ in EG at 160 °C.

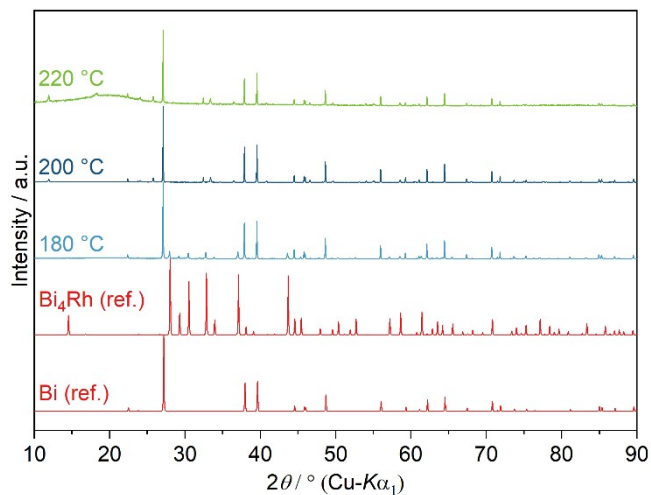


Figure S9. PXRD patterns of solid reaction products obtained by reacting the supernatant obtained from the reaction of $\text{Bi}(\text{NO}_3)_3$ and RhCl_3 at 250 °C for 10 min. Bi (ref.) and Bi_4Rh (ref.) are the calculated diffraction patterns based on the crystal structure of Bi (ICSD entry CSD-64703) and Bi_4Rh (ICSD entry CSD-58854), respectively

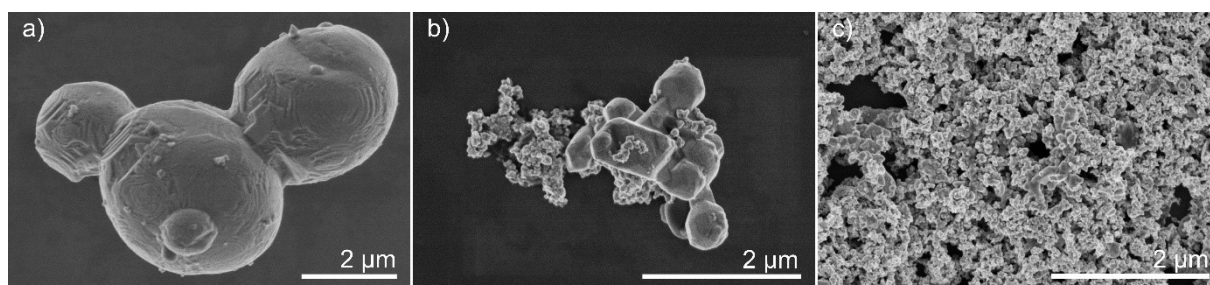


Figure S10. SEM images of particles obtained from the reaction of $\text{Bi}(\text{NO}_3)_3$ and RhCl_3 with added NaOH at 240 °C displaying spherical bismuth particles (a), a mixture of Bi_2Rh , rhodium and bismuth particles (b) and rhodium particles (c).