

## Supporting information

### Inorganic Chemistry

#### One-step Solution Combustion Synthesis of Cobalt Nanopowder in Air Atmosphere: the Fuel Effect

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The TC was made in the assumption that the process was adiabatic (i.e. there was no heat exchange between reactor and environment). Standard temperature (298 K) and standard pressure (101.3 kPa) were accepted as the initial conditions. The influence of air was not taken into account for TC in this case and the TC was carried out for an inert atmosphere (argon).

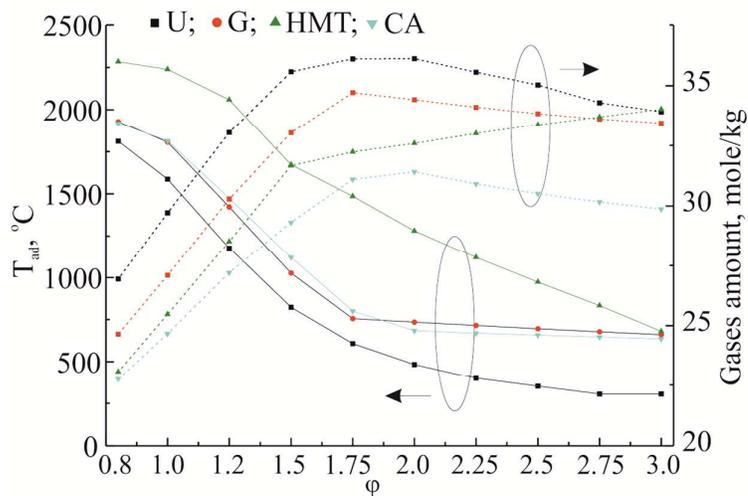


Figure S1. Thermodynamically calculated  $T_{ad}$  and amount of gases products of SCS for experimental systems with different fuels and fuel-to-oxidizer ratios ( $\phi$ ). Solid lines are  $T_{ad}$  curves and dotted lines are gases amount curves.

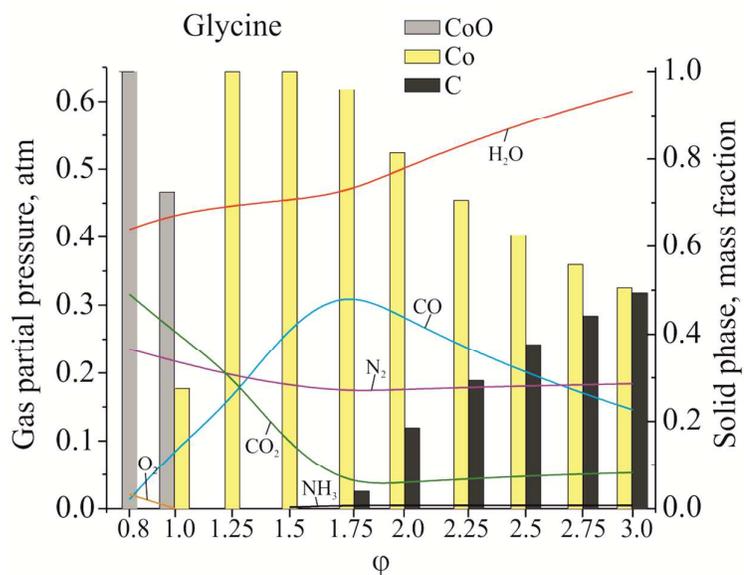


Figure S2. Thermodynamically calculated solid and gases SCS products' composition and content for  $\text{Co}(\text{NO}_3)_2$  - glycine system with different  $\phi$  values.

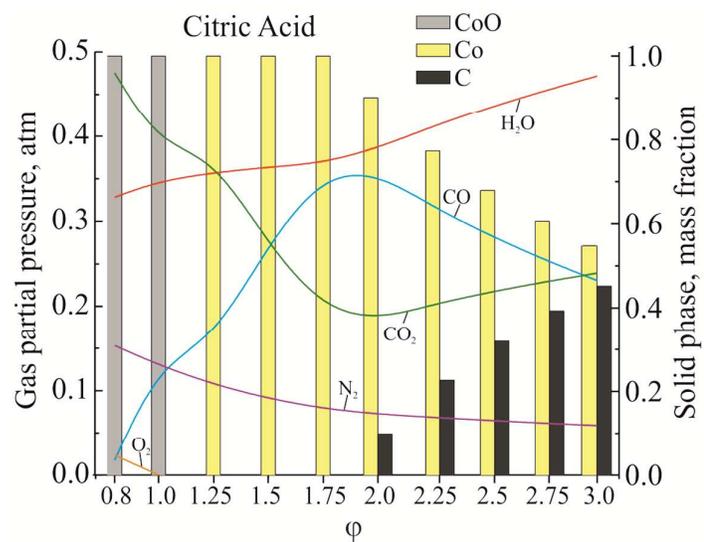


Figure S3. Thermodynamically calculated solid and gases SCS products' composition and content for  $Co(NO_3)_2$  – citric acid system with different  $\phi$  values.

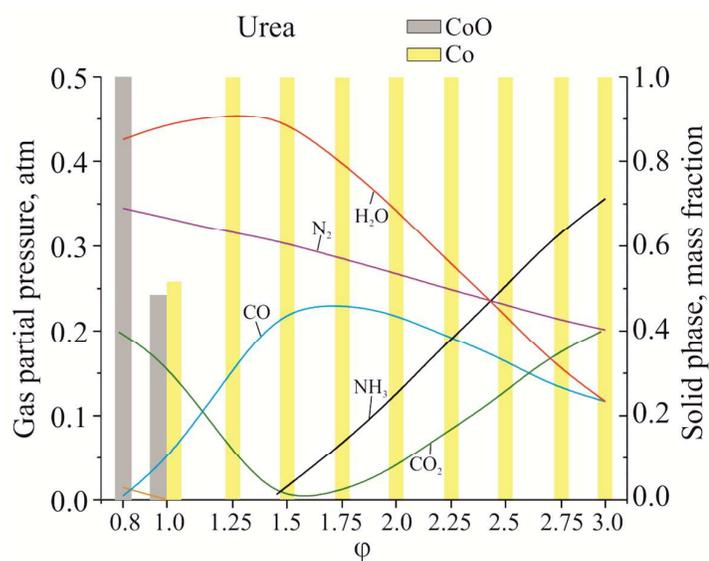


Figure S4. Thermodynamically calculated solid and gases SCS products' composition and content for  $Co(NO_3)_2$  – urea system with different  $\phi$  values.

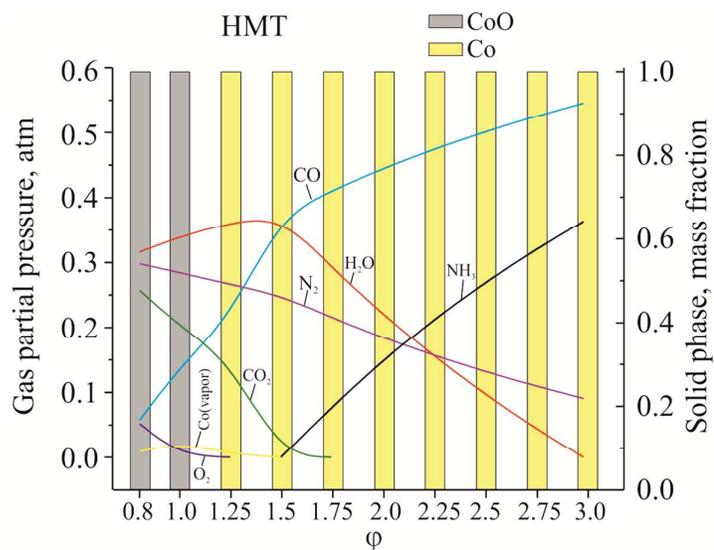


Figure S5. Thermodynamically calculated solid and gases SCS products' composition and content for  $\text{Co}(\text{NO}_3)_2$  – hexamethylenetetramine system with different  $\phi$  values.

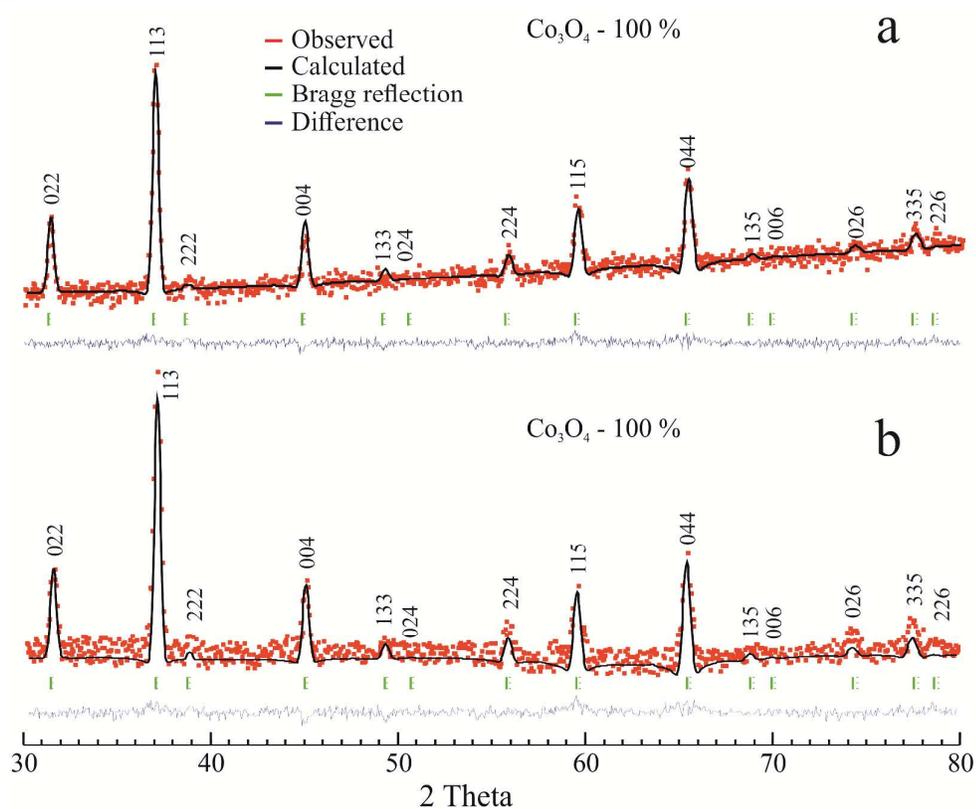


Figure 6S. Rietveld refined XRD patterns of thermally oxidized Co NPs, prepared by microwave assisted SCS in  $\text{Co}(\text{NO}_3)_2$  – hexamethylenetetramine system. (a) – Freshly synthesized Co NPs and (b) – Co NPs after 7 days exposure in air.