Supporting Information for

Magnetic Cobalt and Cobalt Oxide Nanoparticles in Hyperbranched Polyesterpolyol Matrix

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Contents

Among numerous magnetic nanomaterials, cobalt (Co) and its oxides based nanoparticles have attracted particular attention because of their excellent optical, magnetic and catalytic properties. For the synthesis of such compounds the most common methods are solventhermal, thermolysis of the carbonyl or other cobalt complexes and chemical reduction of cobalt salts.

Usage of hyperbranched polymers (HBPs) as a platform for cluster growth, both cluster stability and full control over size and size distribution were achieved by simultaneously allowing access of substrates to the cluster surface. An additional advantage of HBP matrix in the synthesis of practically useful metal nanoparticles is their biosimilar topological structure and simplicity of synthesis. Therefore, for the purposes of cell sorting, medical diagnosis and controlled drug delivery, the strategy for the synthesis of magnetic cobalt nanoparticles is based on the use of non-toxic, biosimilar and biodegradable hyperbranched polymers and dendrimers. Such compounds include hyperbranched polyester polyols (HBPO) of various generations.

In this study, we describe the synthesis of Co nanoparticles via the matrix of non-toxic hyperbranched polyester polyol based on 2,2-bis-hydroxymethyl-propionic acid.

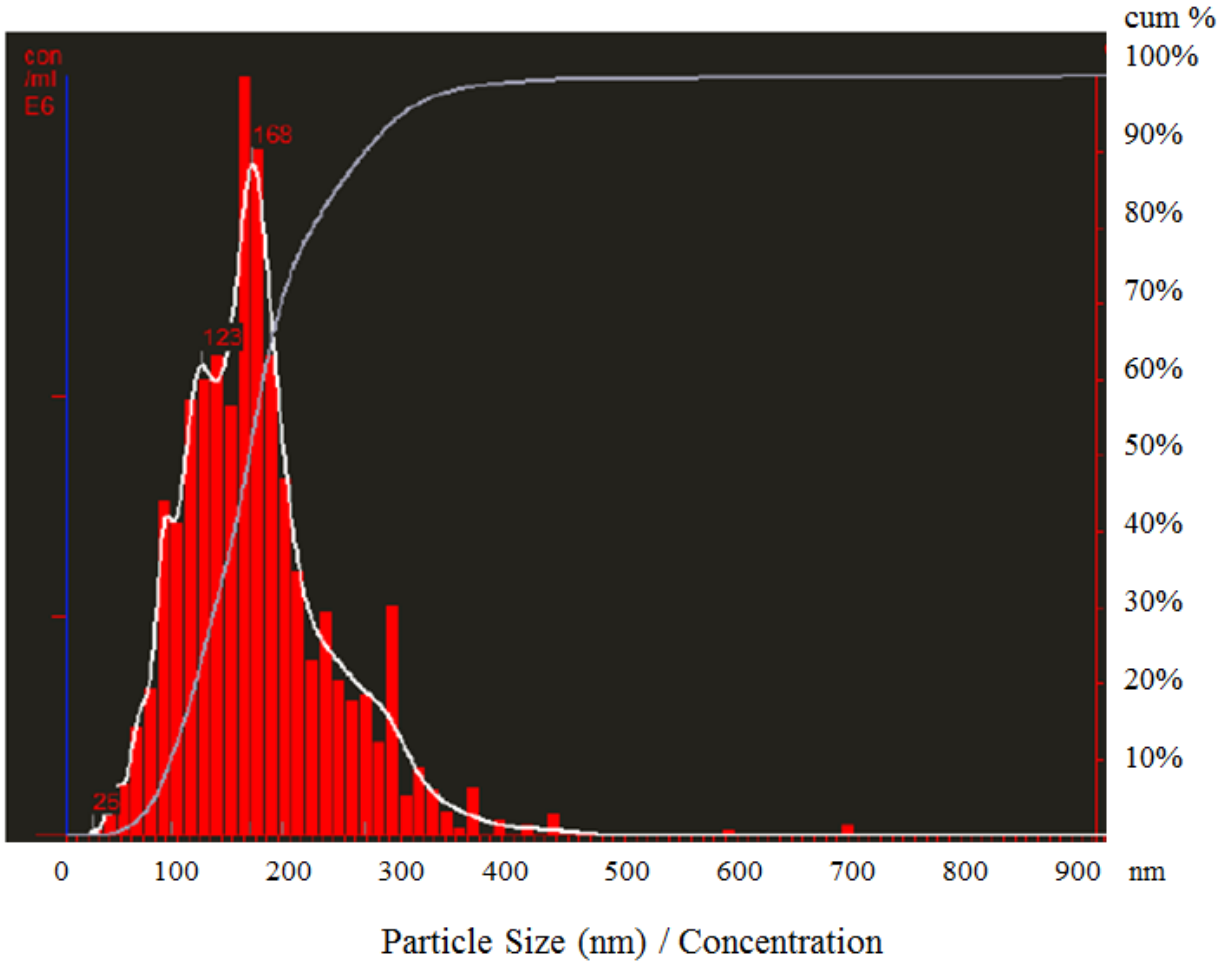

Figure S1. Concentration and size distribution from NTA measurements of complexes Co_{12}(BH20) in aqueous solution.

NTA analysis showed that two types associates of complexes Co_{12}(BH20) was formed. A hydrodynamic diameter of associates were123±15 nm, 168±20 nm.

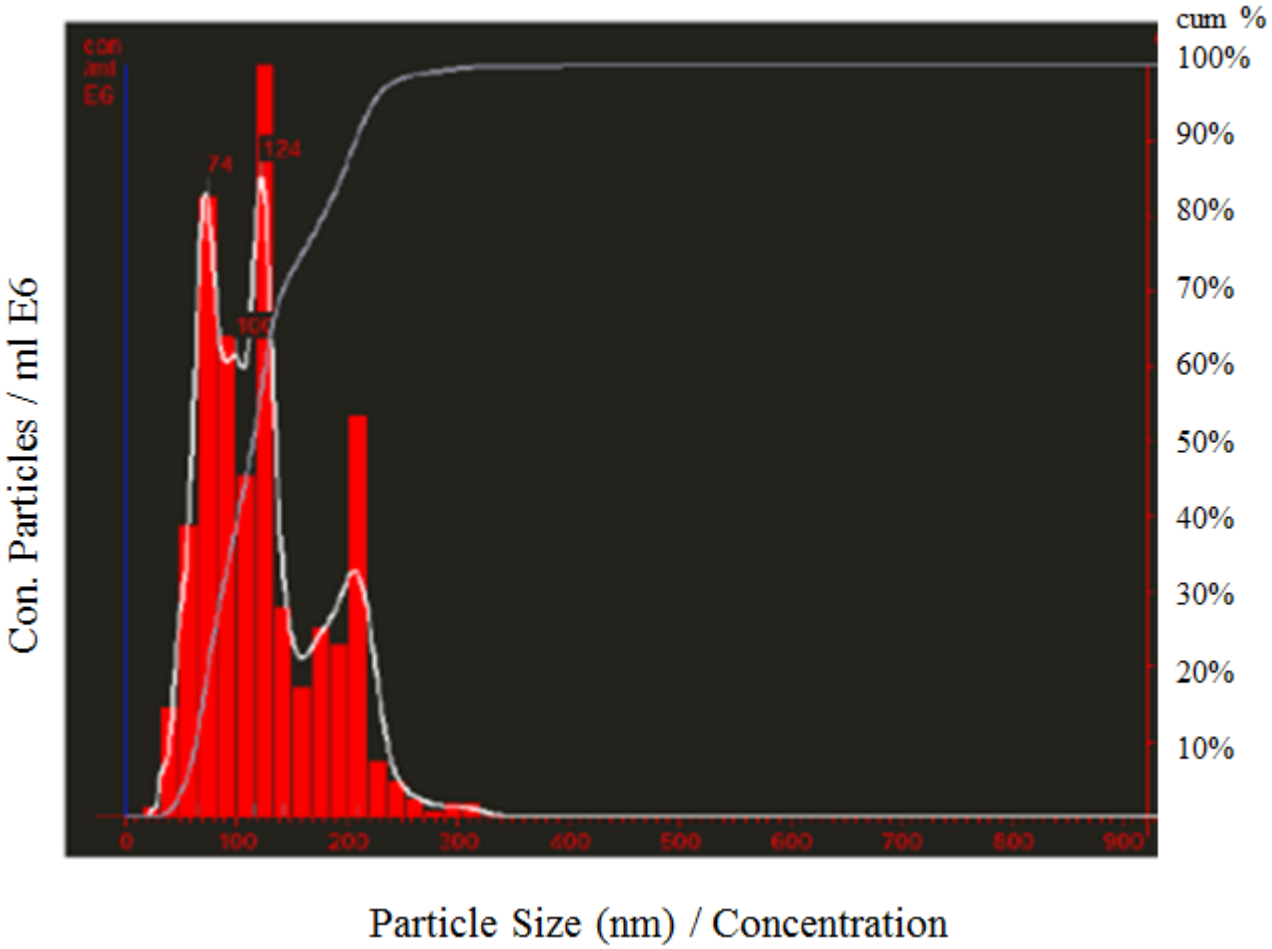

Figure S2. Concentration and size distribution from NTA measurements of complexes Co_{16}(BH20) in aqueous solution.

NTA analysis showed that thri types associates of complexes Co_{16}(BH20) was formed. A hydrodynamic diameter of associates were 74±5 nm,124±10 nm, 210±17 nm.

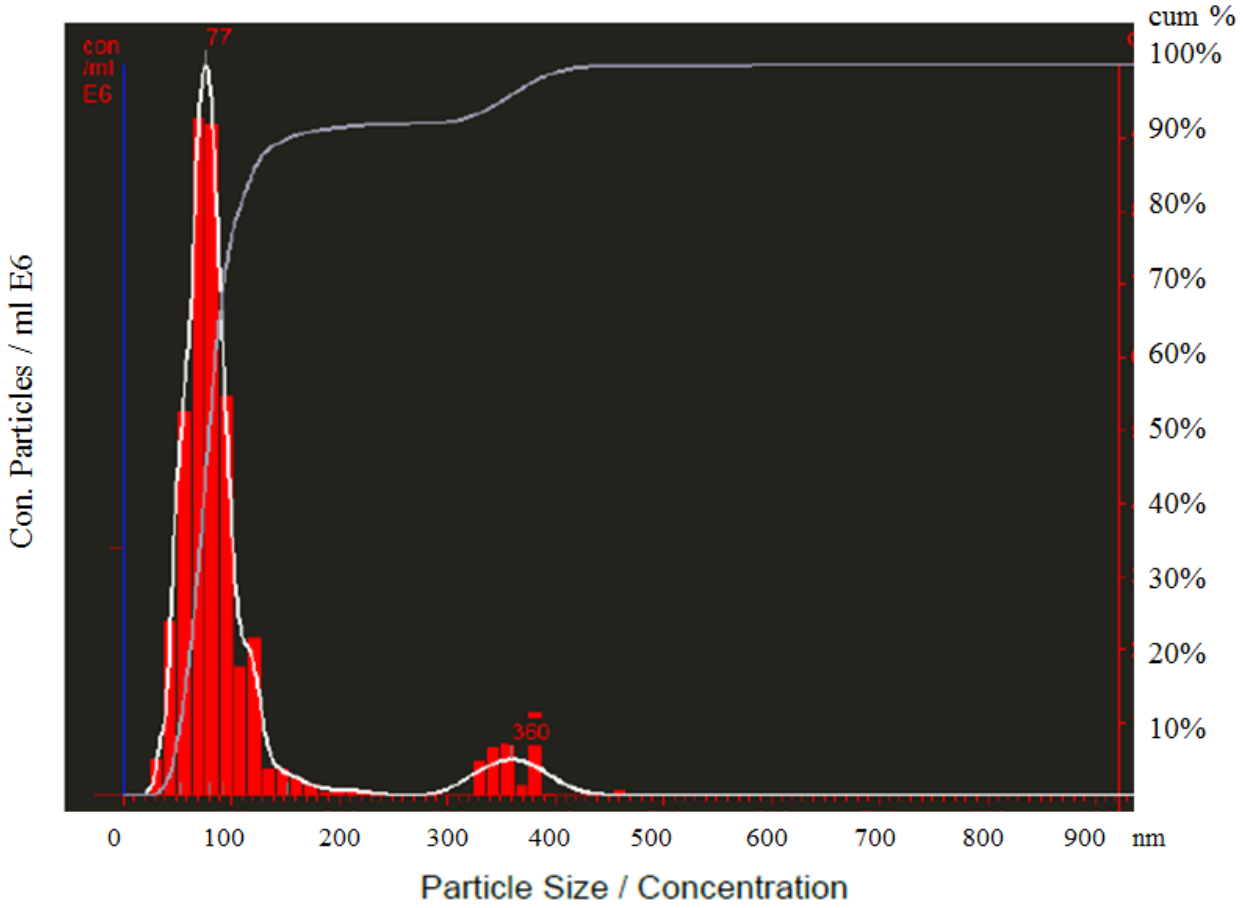

Figure S3. Concentration and size distribution from NTA measurements CoNPs (synthesized in molar ratio Co^{2+} : BH20 = 10:1) in aqueous solution.

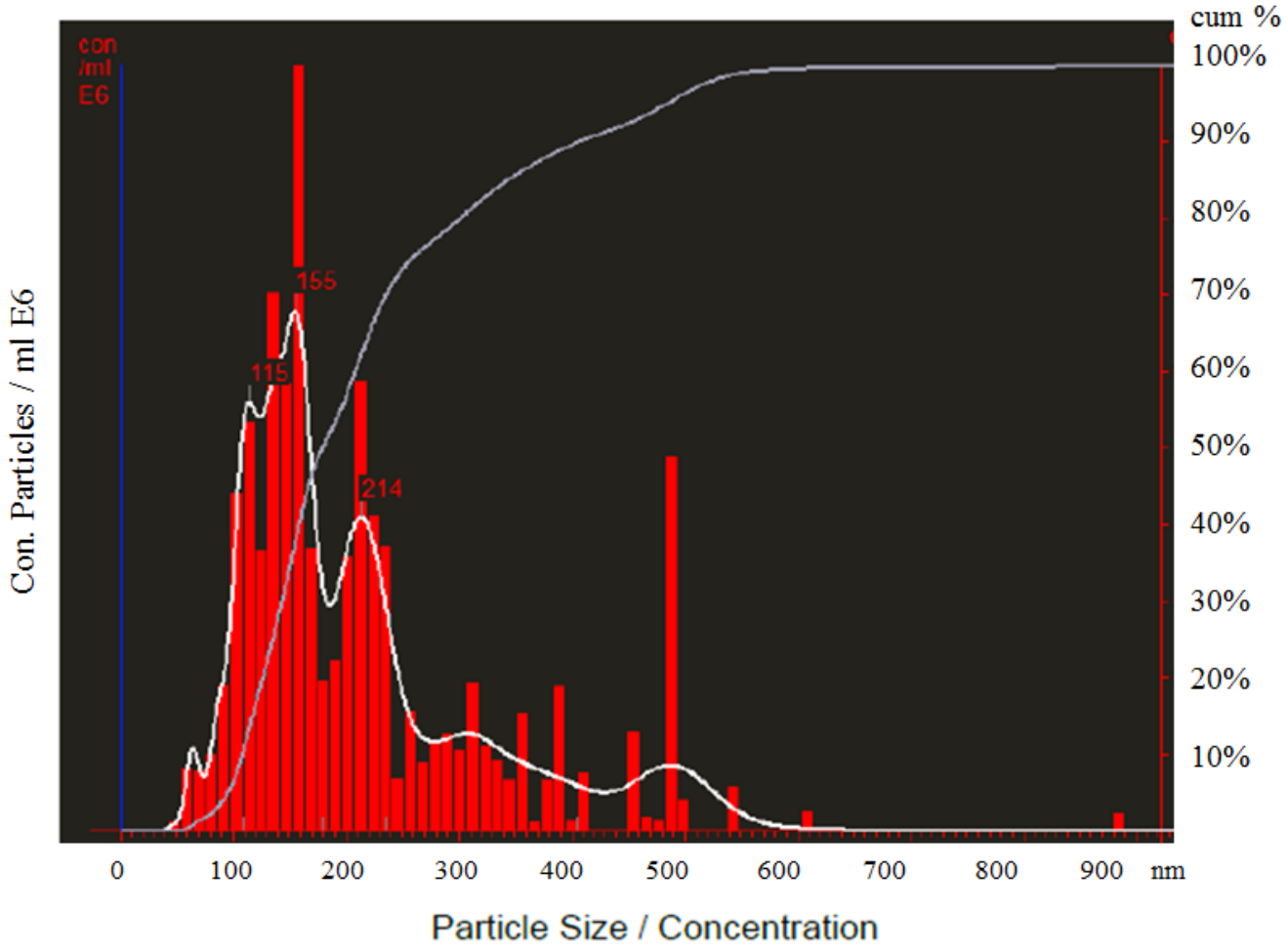

Figure S4. Concentration and size distribution from NTA measurements of oxidized form CoNPs (synthesized in molar ratio Co^{2+} : BH20 = 16:1) (green color) in aqueous solution.

Concentration of oxidized form CoNPs 1.65×10^{6} particles/ ml.

Table S5. Concentration from NTA measurements of complexes Co_n(BH20) and CoNPs in aqueous solution.

Molar ratio Co^{2+}:BH20	Concentration of complexes Co_n(BH20), particles/ ml	Concentration CoNPs, particles/ ml
8:1	5.21×10^{6}	1.59×10^{6}
10:1	2.68×10^{6}	1.57×10^{6}
12:1	3.37×10^{6}	0.58×10^{6}
16:1	1.55×10^{6}	1.08×10^{6}