Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information

Magnetic nanoribbons with embedded cobalt grown inside single-walled carbon nanotubes

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Section I. The full range Raman spectrum

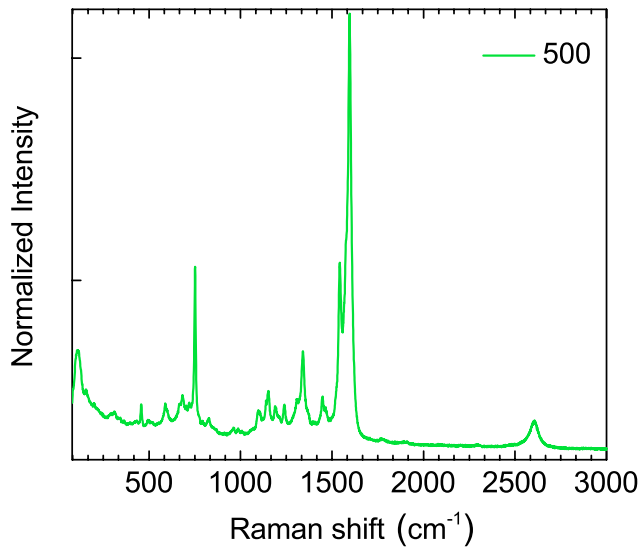

Figure S1. Raman spectrum of CoPcNRs inside SWCNTs obtained at 500 °C polymerization.

Section II. Absorption for differently polymerized structures

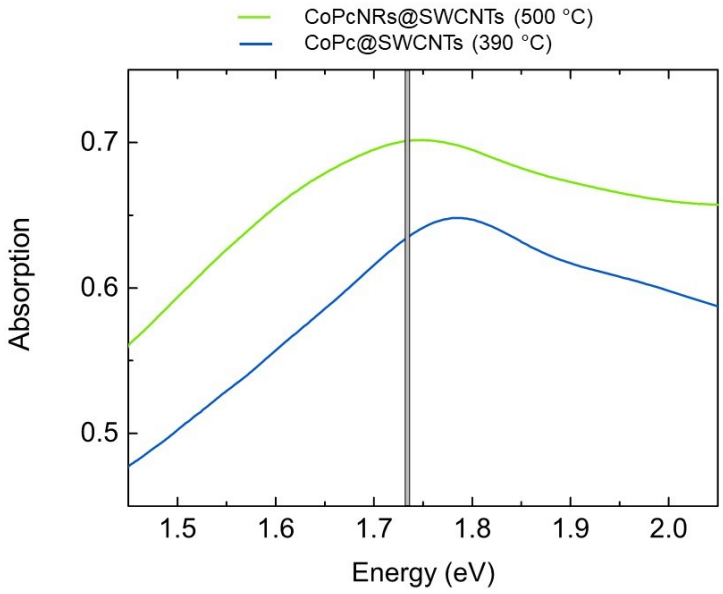

Figure S2. Absorption spectra of pristine SWCNTs and nanotubes after the filling protocols and polymerization step at lower (390 °C) and higher temperature (500 °C). Not fully polymerized NRs (blue color) and CoPcNRs inside SWCNTs as in the main text (green color).

Section III. EDX

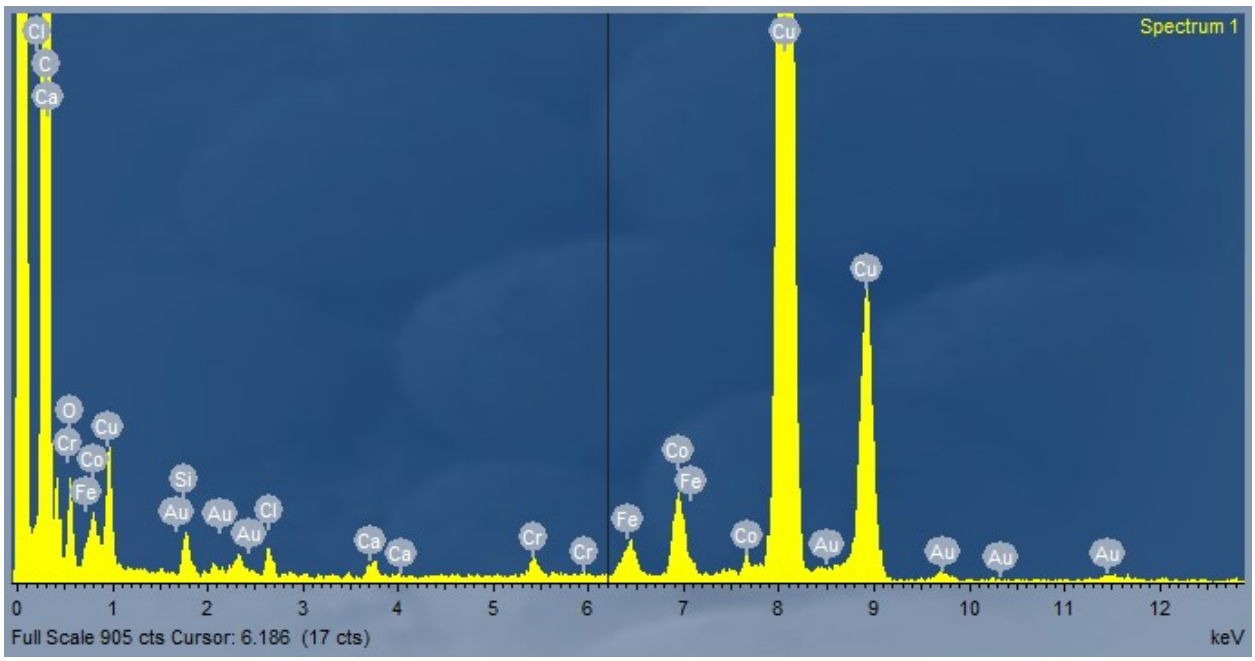

Figure S3. EDX measurements for the CoPcNR@SWCNT samples after the polymerization.

The quantity of the sample was very small, recovered directly from the support used for spectroscopy leading to a low signal-to-noise ratio, and the appearance of several EDX peaks of trace elements that result from sample processing. However, the presence of Co is detected despite its very low atomic percent in the material Even in the best case scenario (i.e. all nanotubes are filled) we expect no more than 0.5 atomic %, which is on the threshold of detectable. Other elements that are present most likely originate from substrate (Si and O) and tools used for handling the sample (steel – Fe and Cr) water/solvent (Ca and Cl) and from the material of TEM grid sample holder (Cu).

Section IV. Additional HR-TEM images

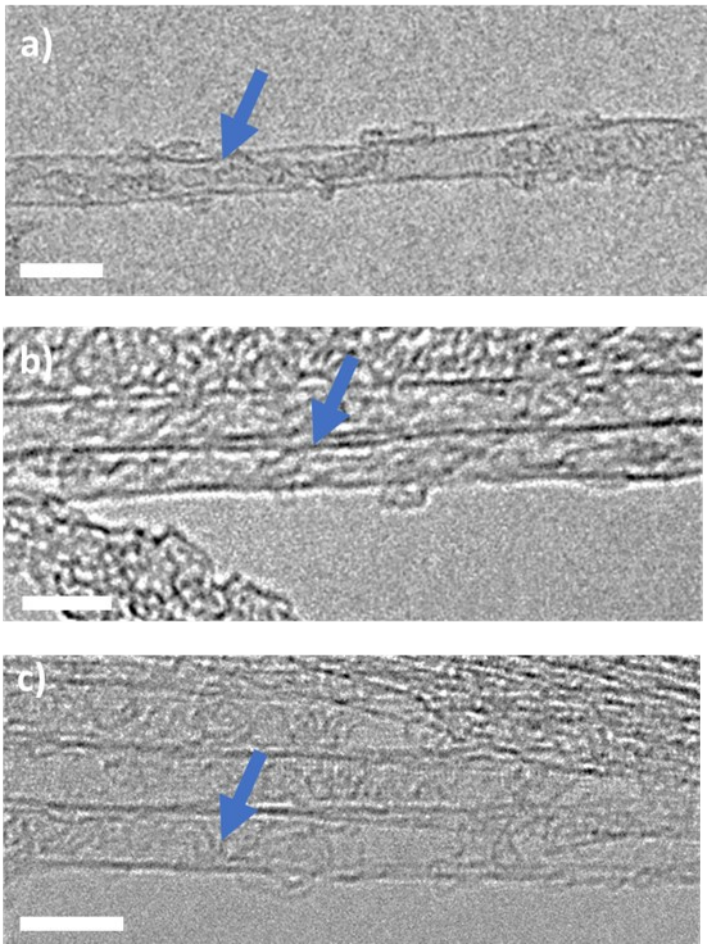

Figure S4. HR TEM images of various examples CoPcNRs in SWCNTs. Ribbon twists are noted by the arrows. The scale bars are 2 nm.

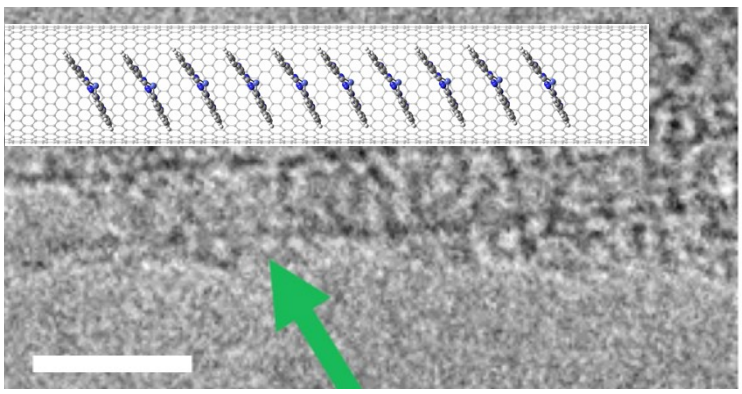

Figure S5. HR TEM images of CoPc molecules in SWCNTs (area marked with the green arrow indicates a section of about 10 stacked CoPc molecules). Elongated twisted structures characteristic for CoPcNR are not observed in this material. The scale bar is 2 nm.

Section V. Modelled relaxation of the molecule inside the nanotube.

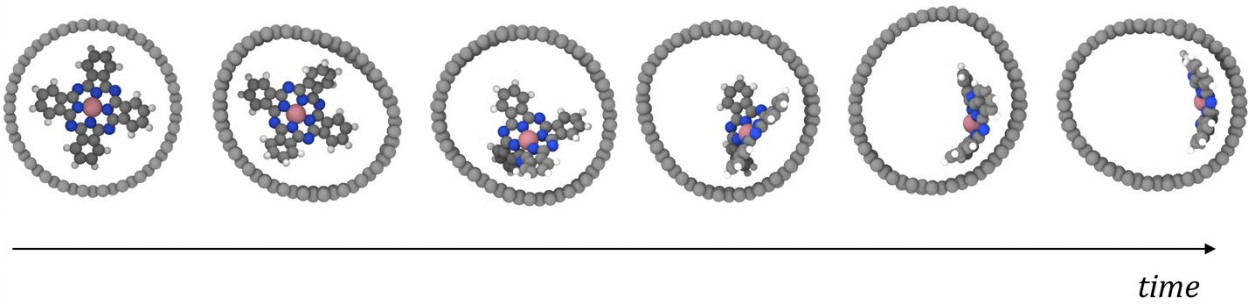

Figure S6. Snapshots of molecule motion during time inside the nanotube. The CoPc molecules tend to stick to the inner surface and bend. The behavior might depend on SWCNT diameter.