Supporting Information for:

A Multifunctional Block Copolymer – Where Polymetallic and Polyelectrolyte Blocks Meet

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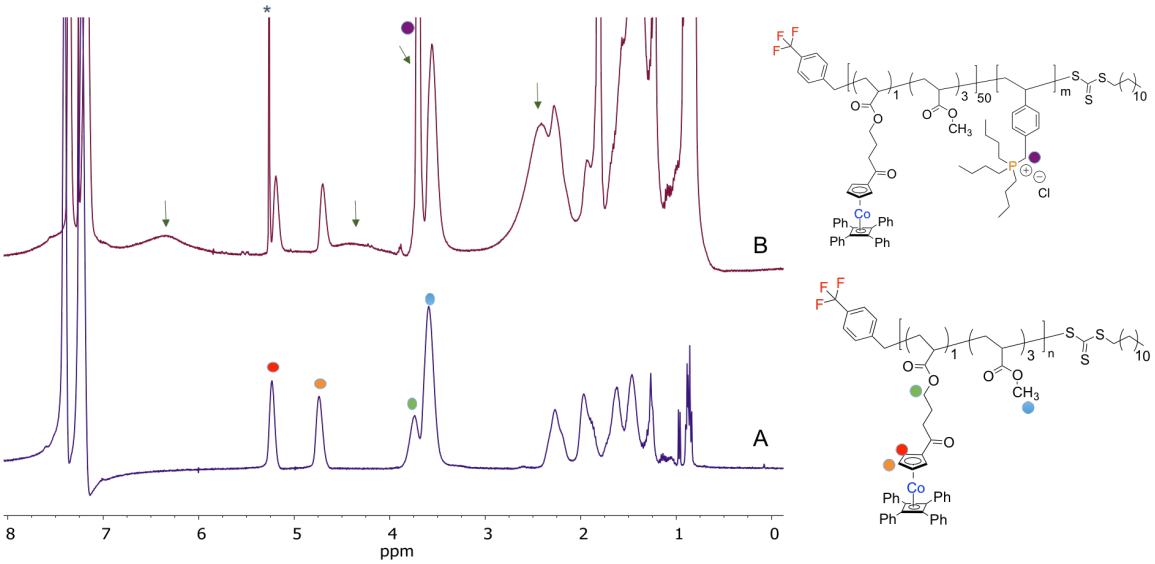
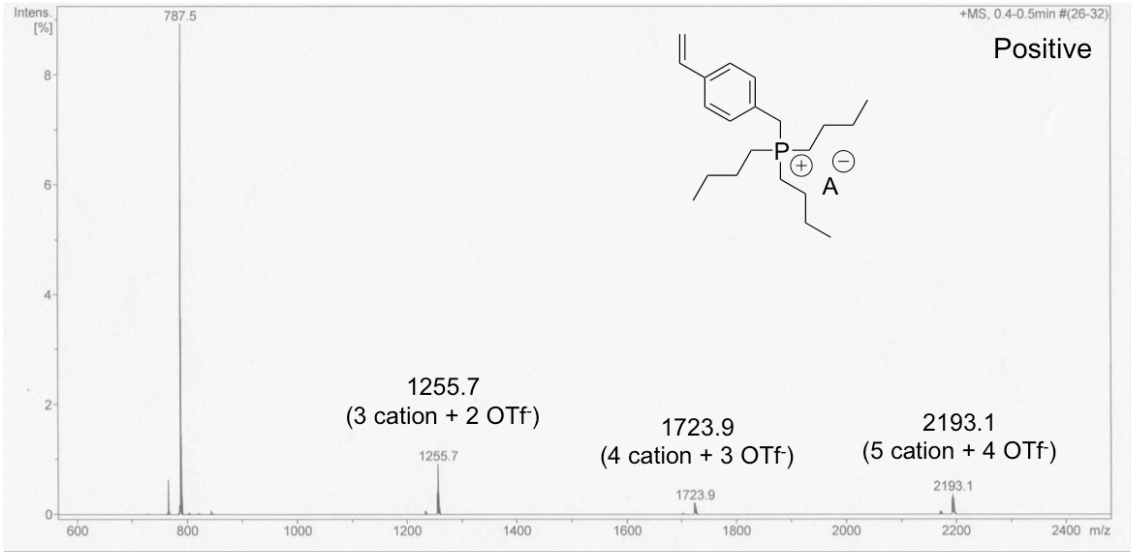
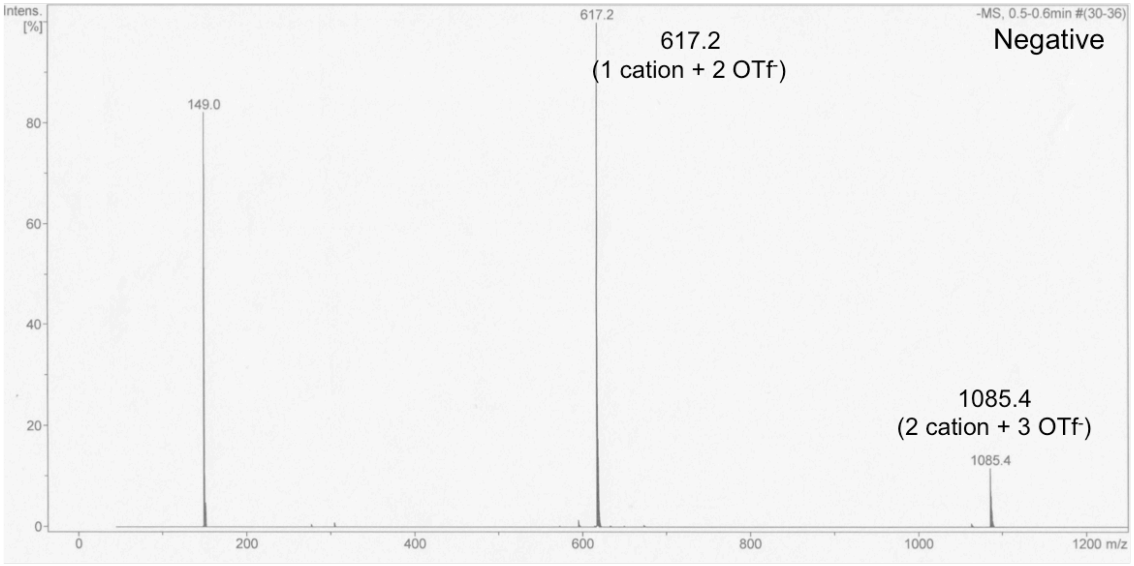


Figure S.I.1. ^{1}H NMR Spectrum of random copolymer **5** (spectrum A) and a block copolymer consist of random copolymer **5** and polymerized **6** (spectrum B) in deutrated chloroform. In Spectrum B, arrows point to the broad/overlapping signals of the polyelectrolyte block. (*trace of DCM).



Note: Clusters with Cl such as 637 (2 cation + 1 Cl^-), 1027 (3 cation + 2 Cl^-) were not detected.



Note: Clusters with Cl such as 743 (2 cation + 3 Cl^-), 1099 (3 cation + 4 Cl^-) were not detected.

Figure S.I.2. Positive and negative mass spectroscopy of purified **7.**

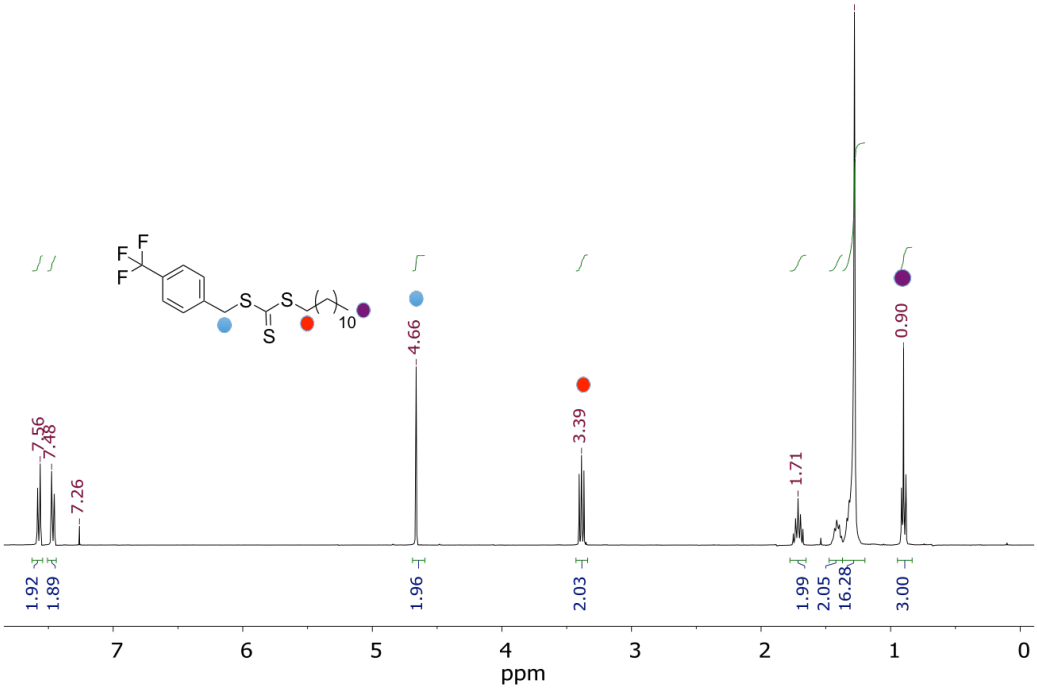


Figure S.I.3. [1]H NMR Spectrum of purified RAFT agent **8** in deutrated chloroform.

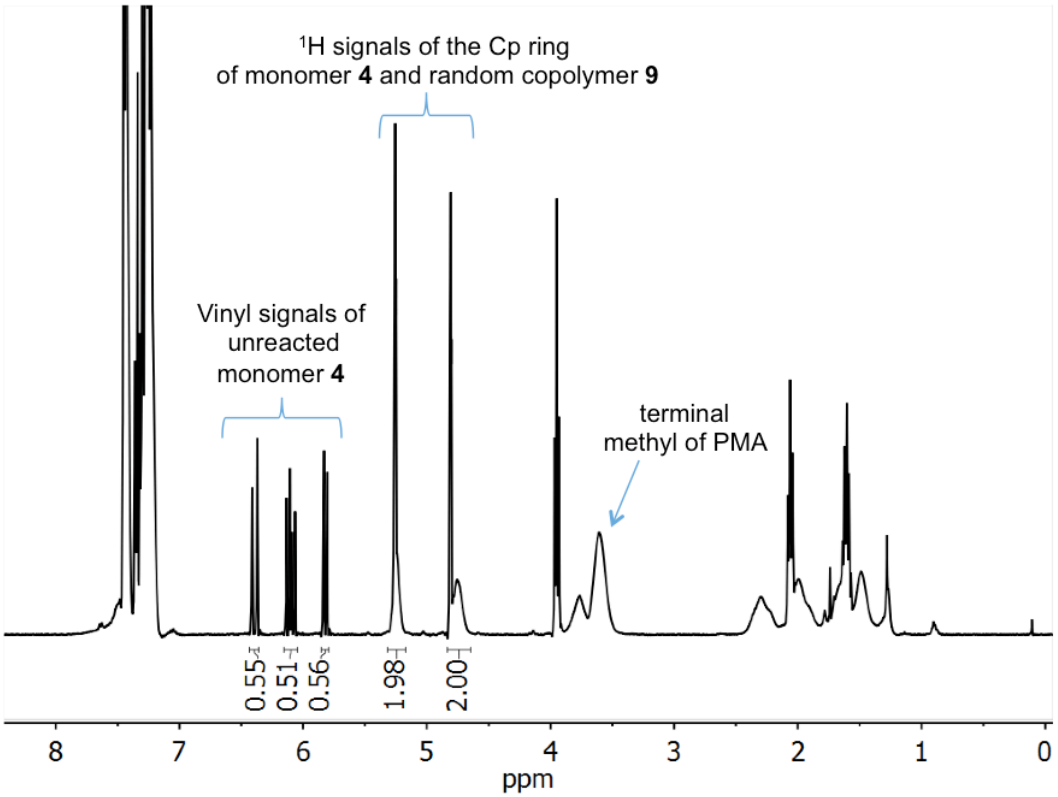


Figure S.I.4. [1]H NMR spectrum of crude random copolymer **9** at 20 minutes polymerization reaction time in deutrated chloroform. (Relative integrations values indicate 47% monomer conversion)

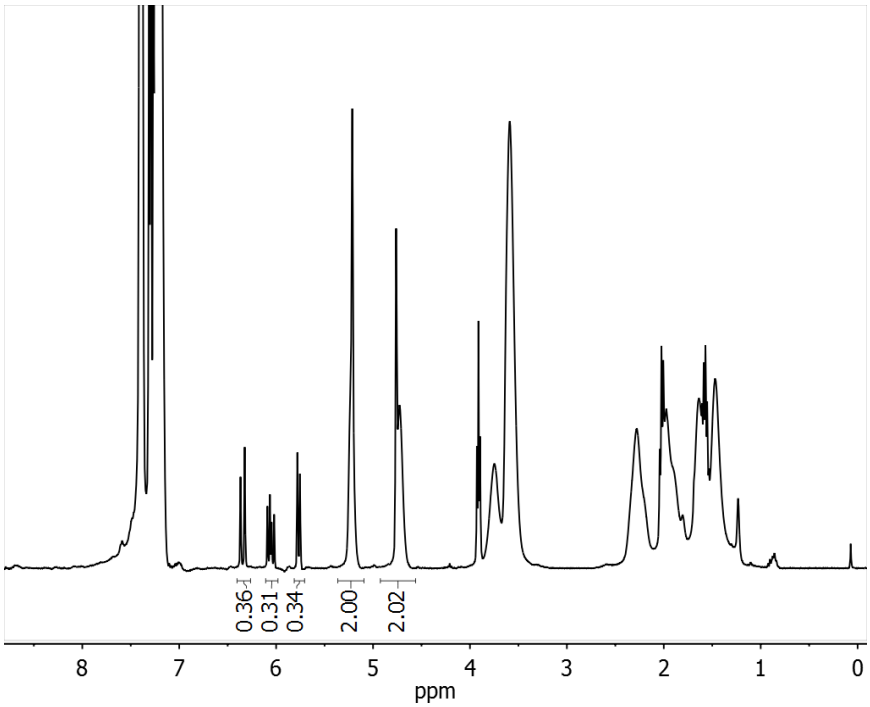


Figure S.I.5. ^{1}H NMR spectrum of crude random copolymer **9** at 40 minutes polymerization reaction time in deutrated chloroform. (Relative integrations values indicate 77% monomer conversion)

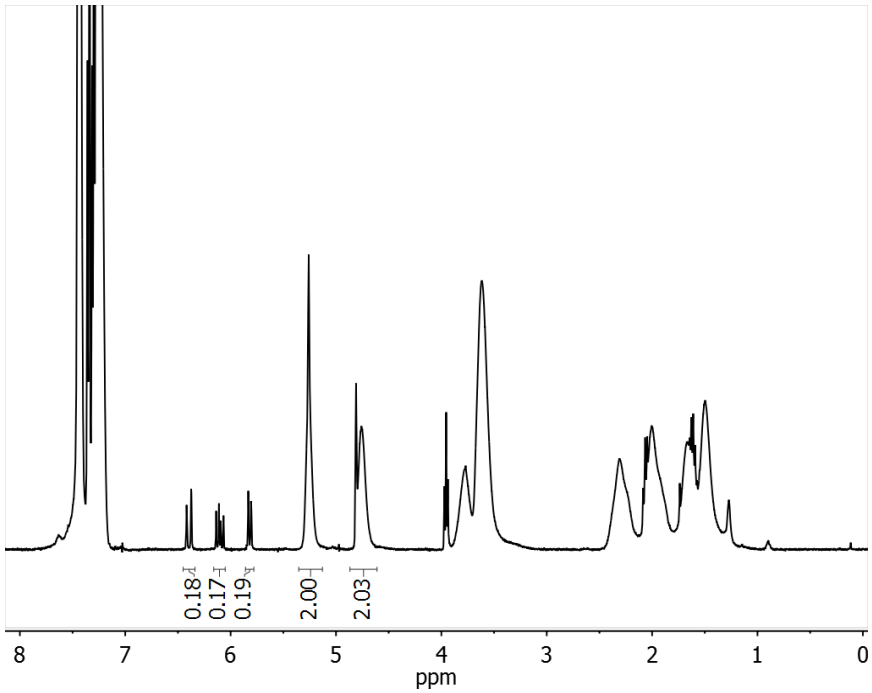


Figure S.I.6. ^{1}H NMR spectrum of crude random copolymer **9** at 60 minutes polymerization reaction time in deutrated chloroform. (Relative integrations values indicate 82% monomer conversion)

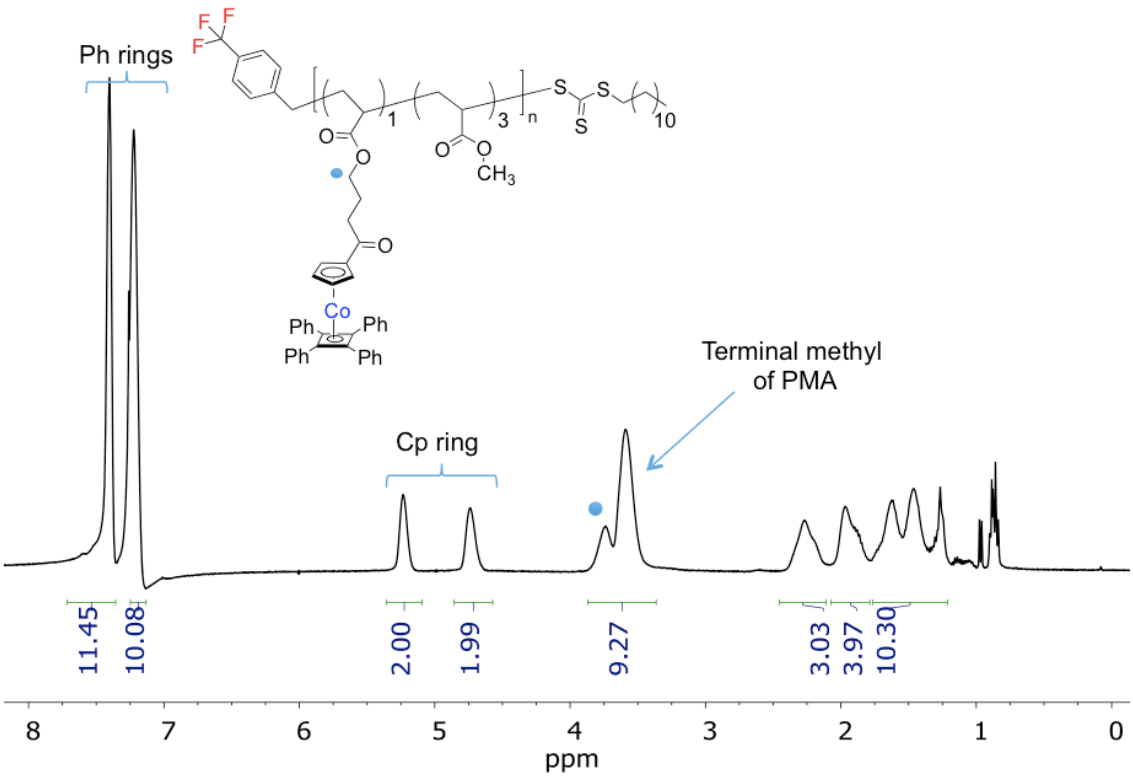


Figure S.I.7. ^{1}H NMR spectrum of purified PolyCpCoCb$_{50}$-*r*-PMA$_{150}$ random copolymer (**9**) at 60 minutes polymerization reaction time.

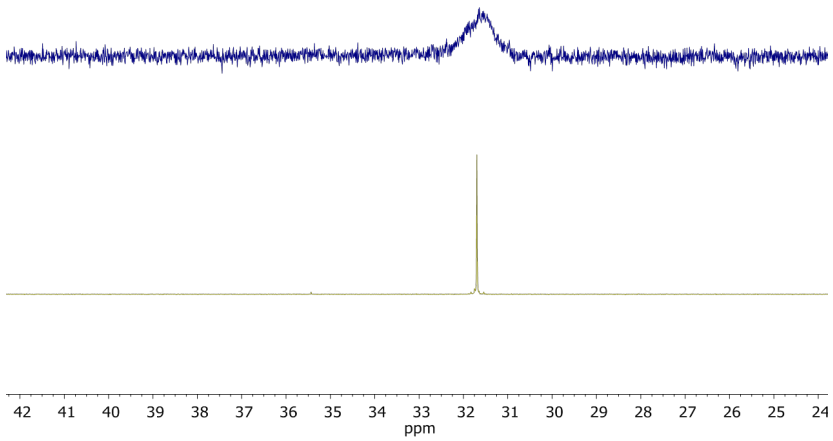


Figure S.I.8. ^{31}P{^{1}H} NMR Spectra of crude (bottom) and purified (top) (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-}) (**10**)

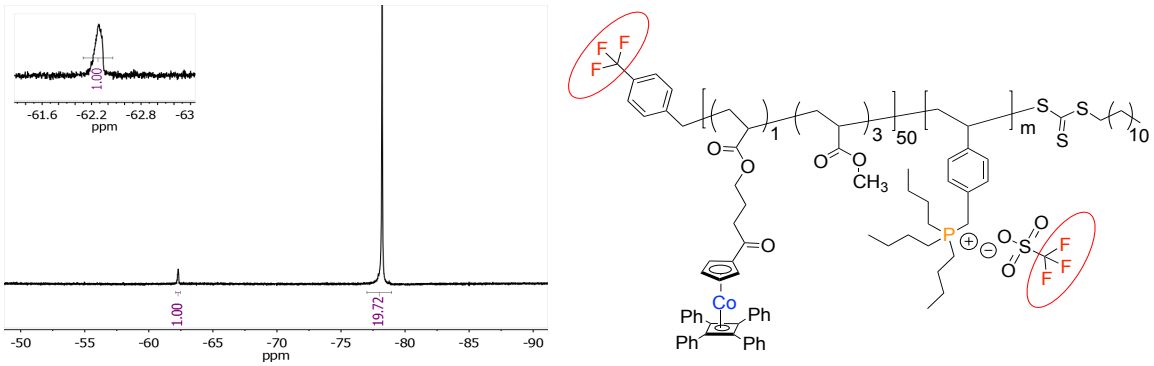


Figure S.I.9. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{20}$ (**10**) after 15 minutes polymerization reaction time in deutrated chloroform.

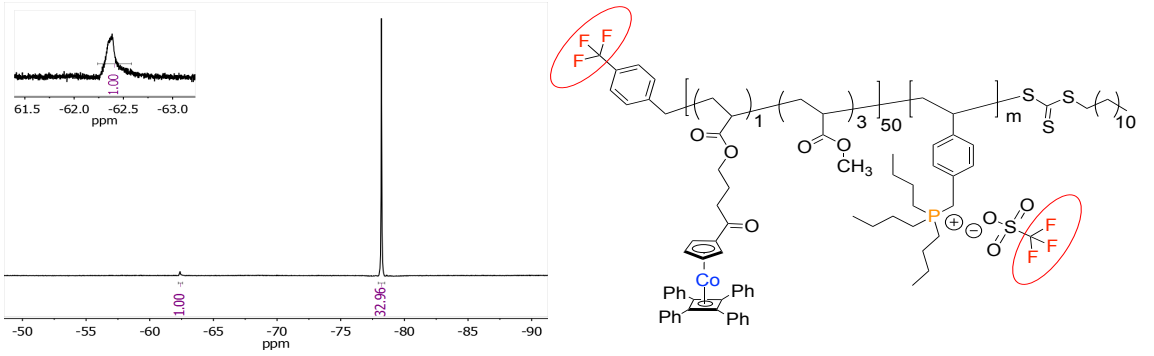


Figure S.I.10. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{33}$ (**10**) after 30 minutes polymerization reaction time in deutrated chloroform.

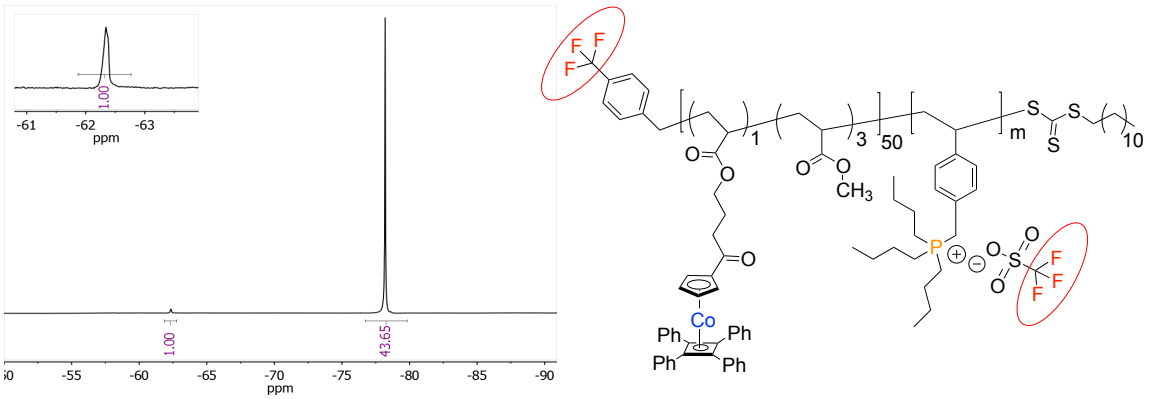


Figure S.I.11. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{44}$ (**10**) after 45 minutes polymerization reaction time in deutrated chloroform.

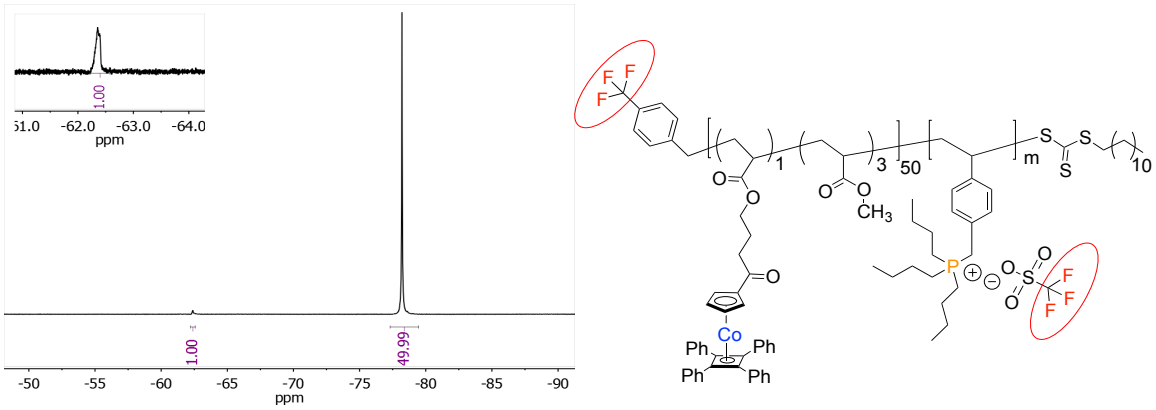


Figure S.I.12. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{50}$ (**10**) after 60 minutes polymerization reaction time in deutrated chloroform.

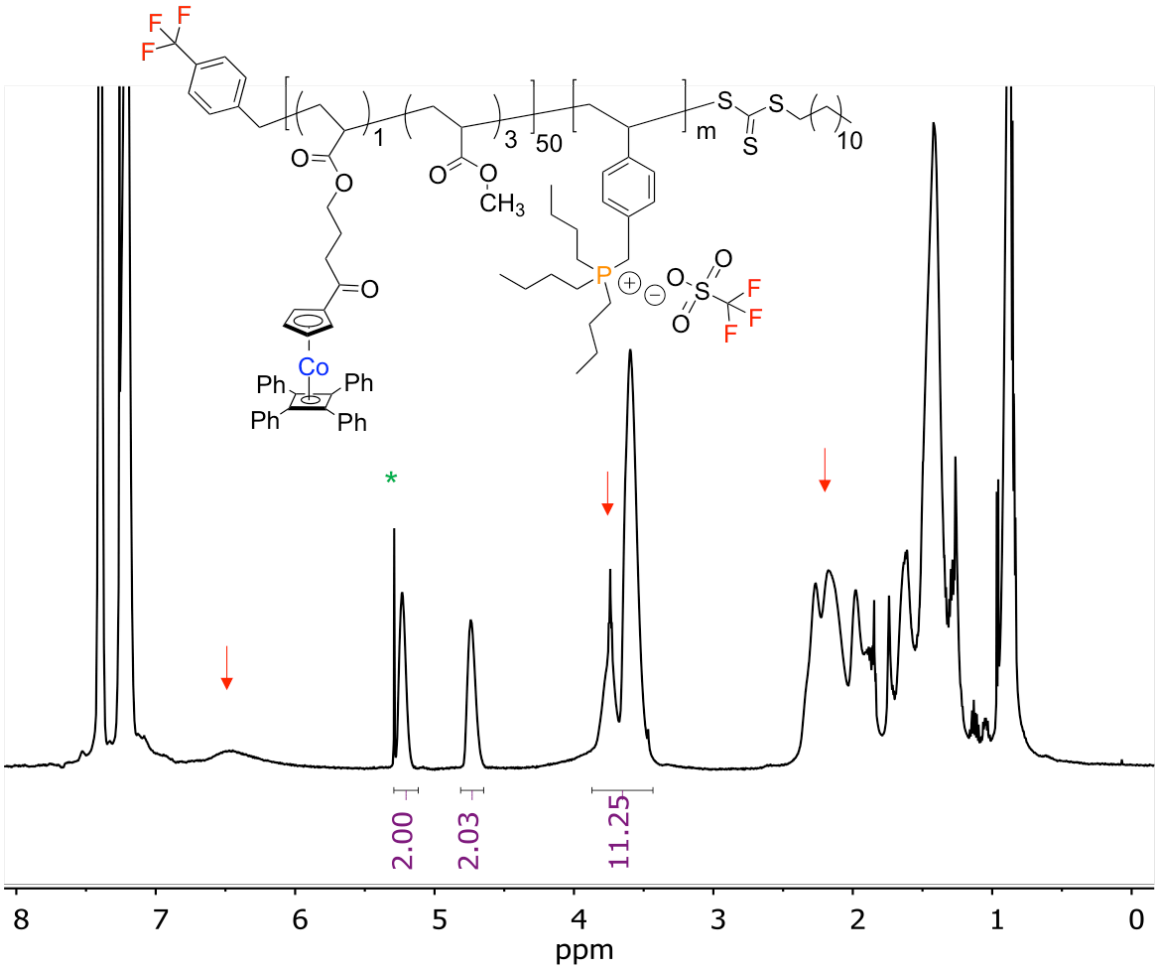


Figure S.I.13. ^{1}H NMR spectrum of purified block copolymer **10** after 60 minutes polymerization reaction time. Arrows show broad signals of polyelectrolyte block in deutrated chloroform. (*Residue of dichloromethane)

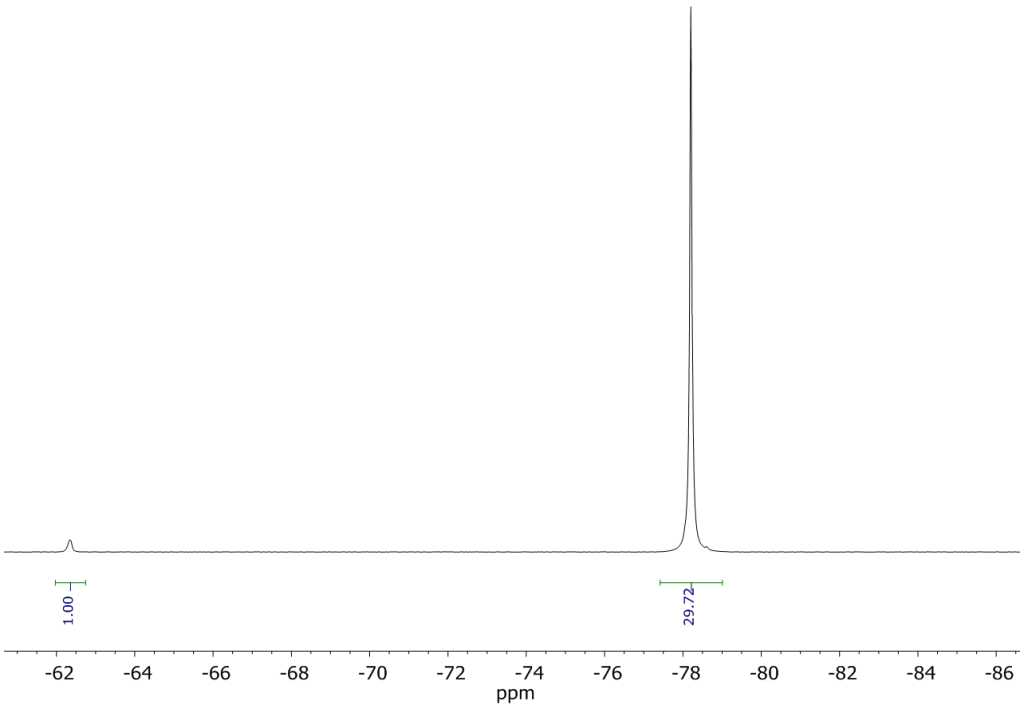


Figure S.I.14. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{30}$ (**10**).

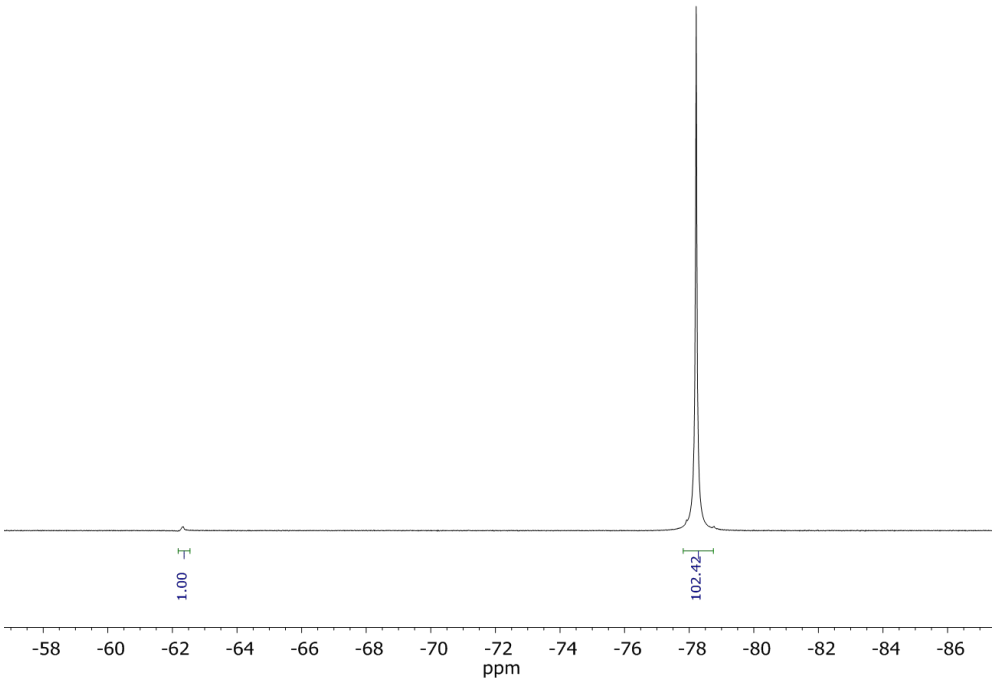


Figure S.I.15. $^{19}F\{^{1}H\}$ NMR Spectrum of purified (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{100}$ (**10**).

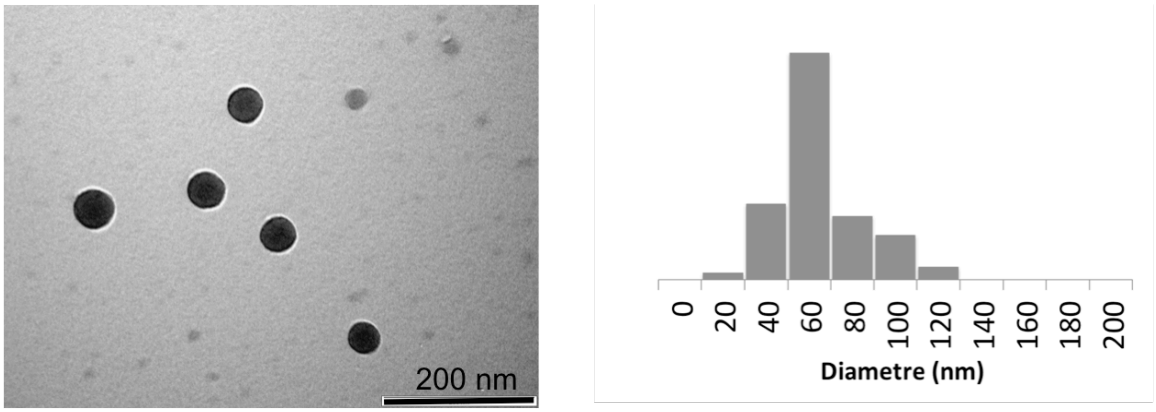


Figure S.I.16. TEM Image of spherical micelles made by injection of THF solution of (PolyCpCoCb$_{50}$-r-PMA$_{150}$)-b-(PS(P^{+}OTf^{-})$_{100}$ (**10**) into methanol and size distribution analysis based on TEM data.

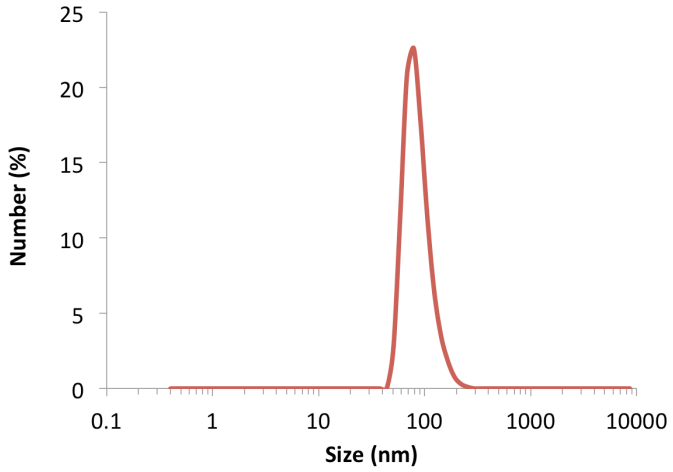


Figure S.I.17. DLS analysis of spherical micelles made by injection of THF solution of (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-})$_{100}$ (**10**) into methanol (130 nm).

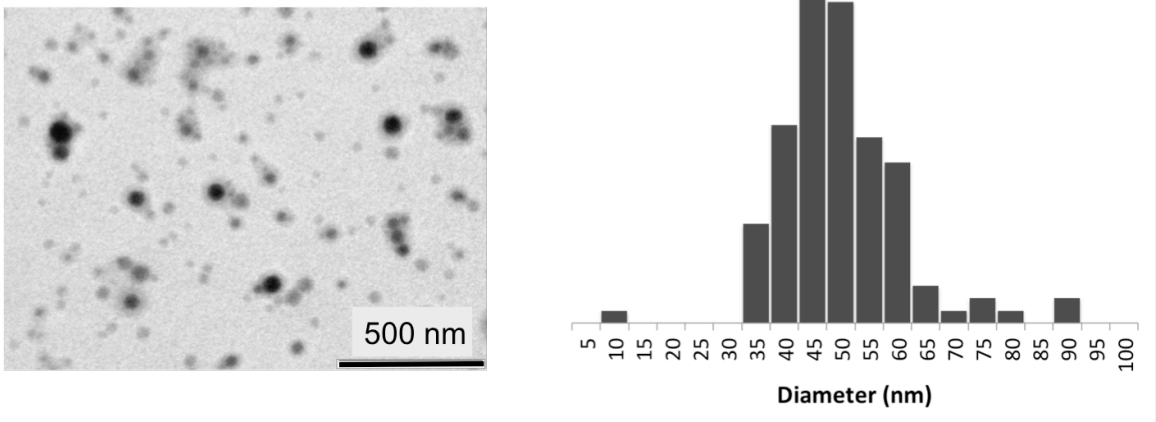


Figure S.I.18. TEM Image of heterobimetallic micelles made by injection of DCM solution of (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}AuCl$_4^{-}$))$_{100}$ into benzene and size distribution analysis based on TEM data.

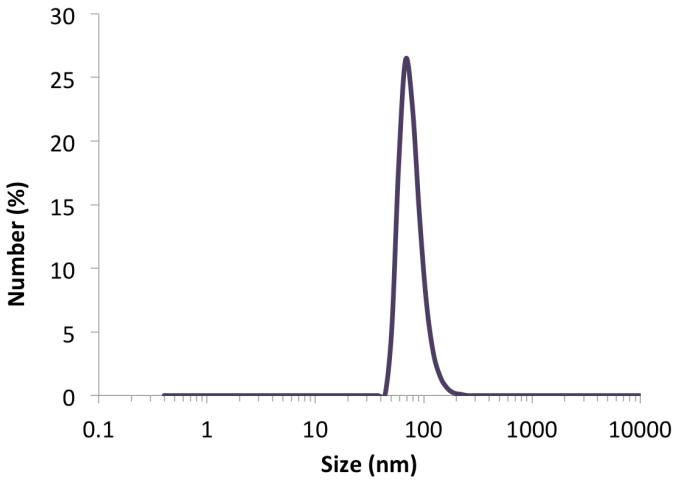


Figure S.I.19. DLS analysis of heterobimetallic micelles made by injection of DCM solution of (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}AuCl$_4^{-}$))$_{100}$ into benzene (65 nm).

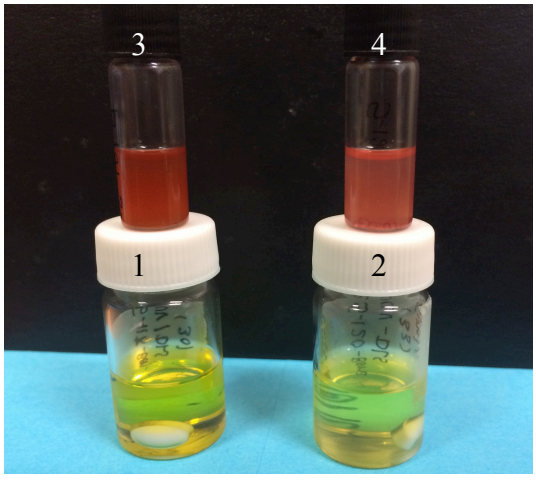


Figure S.I.20. Heterobimetallic micelles with Poly-7AuCl core and PolyCpCoCb$_{50}$-*r*-PMA$_{150}$ corona made by injection of DCM solution of (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}AuCl$_4^{-}$))$_m$ (1; m=30, 2; m=100) into benzene. Vials on top are the same micelles samples after the core is reduced to AuNPs using NaBH$_4$ (3; m=30, 4; m=100).

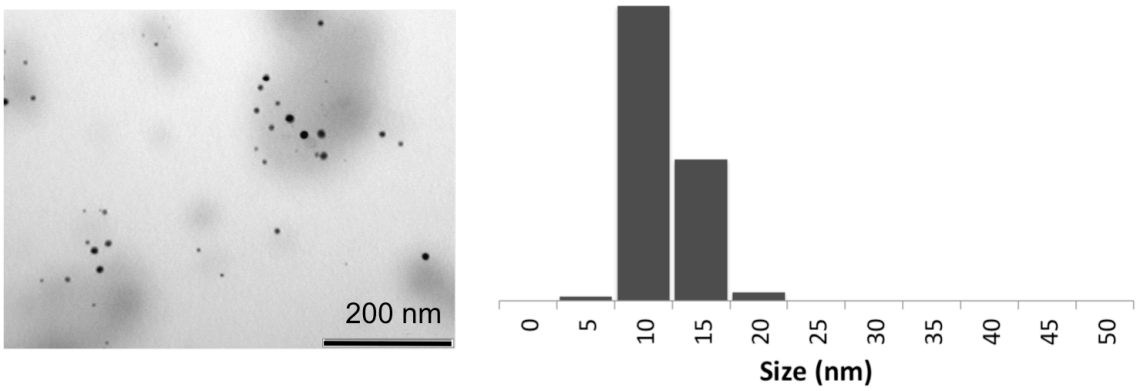


Figure S.I.21. TEM Image of AuNPs made by reduction of heterobimetallic micelles made [(PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)- *b*-(PS(P^{+}AuCl$_4^{-}$))$_m$] and size distribution analysis based on TEM data.

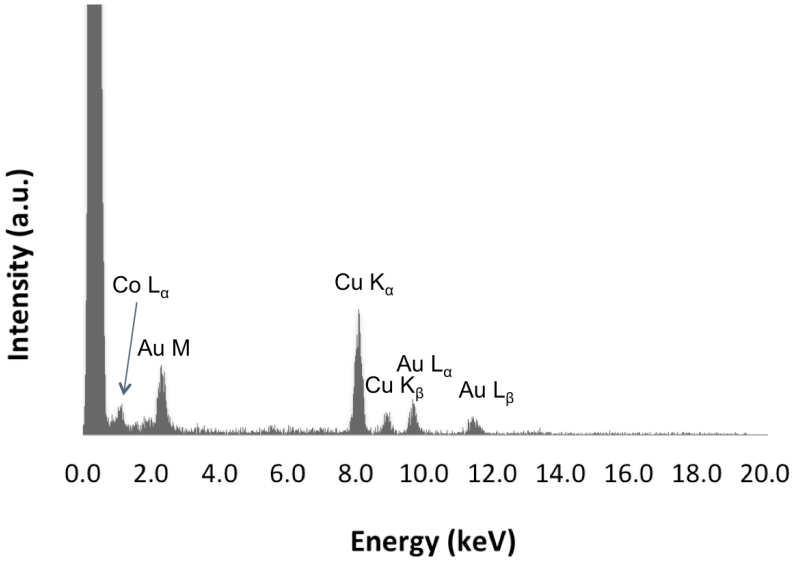


Figure S.I.22. EDX analysis of AuNPs (copper signals are form the copper grid).

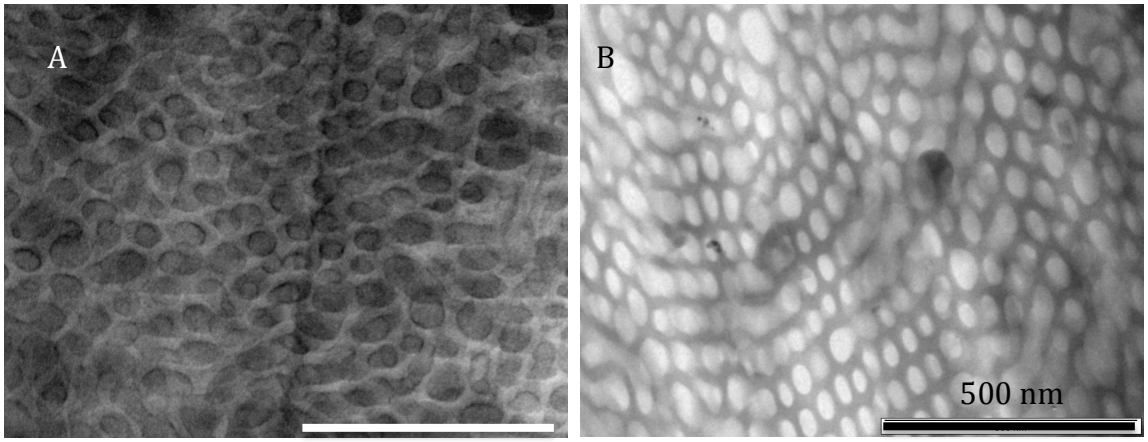


Figure S.I.23. A) TEM image of microtomed section of phase separated (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-}))$_{30}$ stained with RuO_4 B) and stained with $HAuCl_4$.

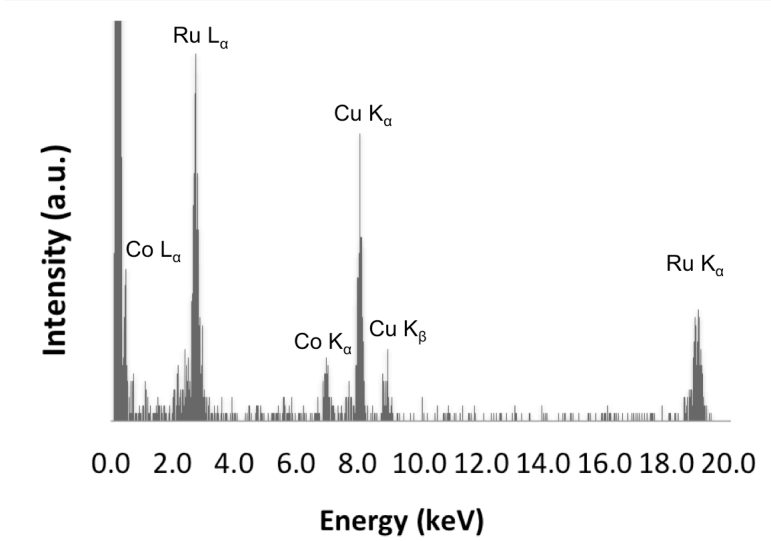


Figure S.I.24. EDX analysis of microtomed sections of (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-}))$_{30}$ stained by RuO_4 revealing its elemental composition.

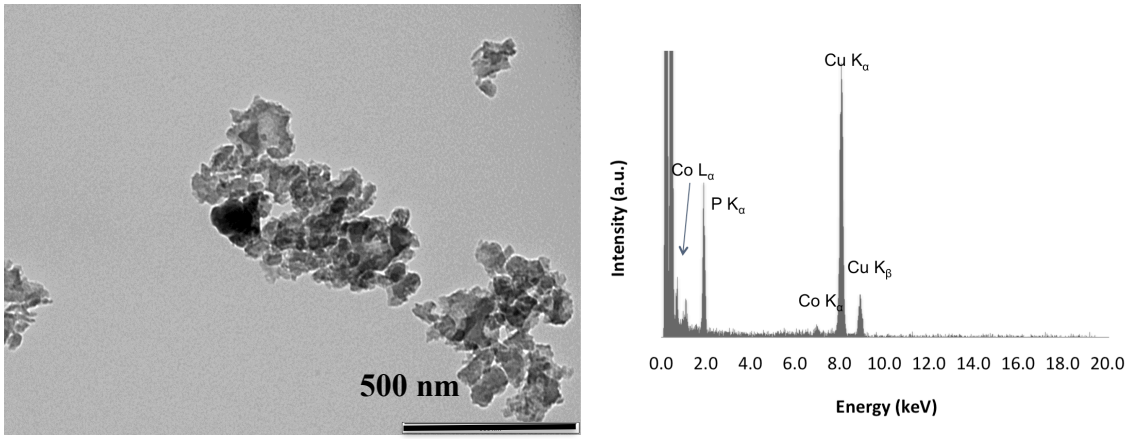


Figure S.I.25. TEM image (left) and EDX analysis (right) of pyrolyzed (PolyCpCoCb$_{50}$-*r*-PMA$_{150}$)-*b*-(PS(P^{+}OTf^{-}))$_{30}$ block copolymer .

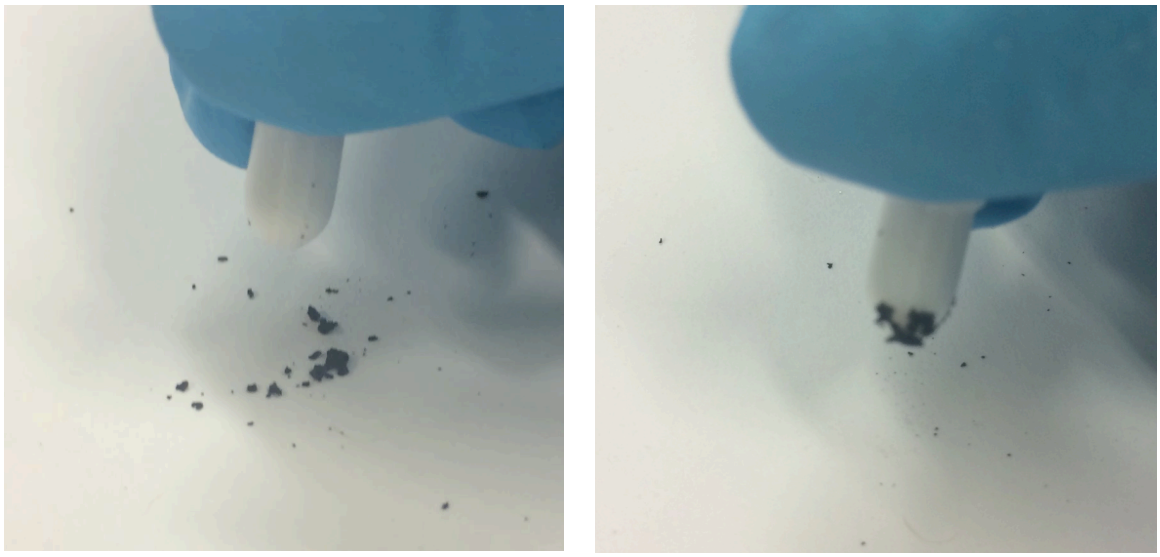


Figure S.I.26. The pyrolyzed materials were attracted to permanent magnet, indicating the presence of magnetic particles.