Organic-inorganic hybrid materials designed by controlled radical polymerization and mediated with commercial dual functional organophosphorous coupling agents

Edgar Cao, Eric Prouzet* and Valérie Héroguez*

Electronic Supplementary Information

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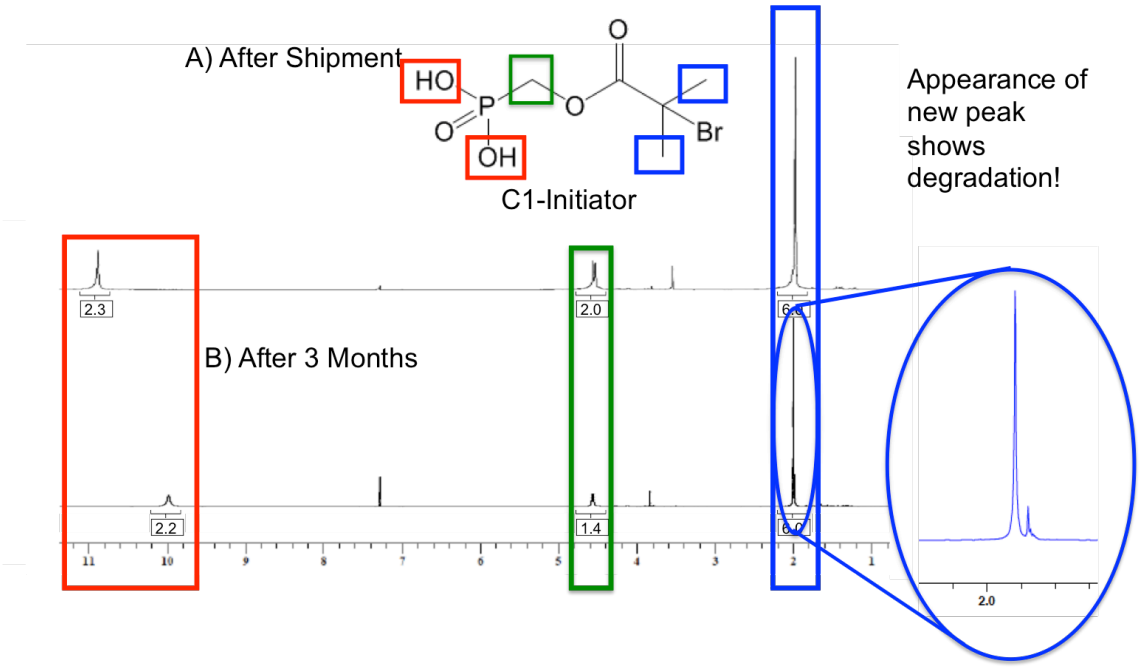

Figure S1: 1H NMR for C1-Initiator in $CDCl_3$ for A) provided from supplier upon receiving product and B) 3 months after the C1-Initiator was received. We observe the formation of a new peak, indicating that there is degradation of the C1-Initiator.

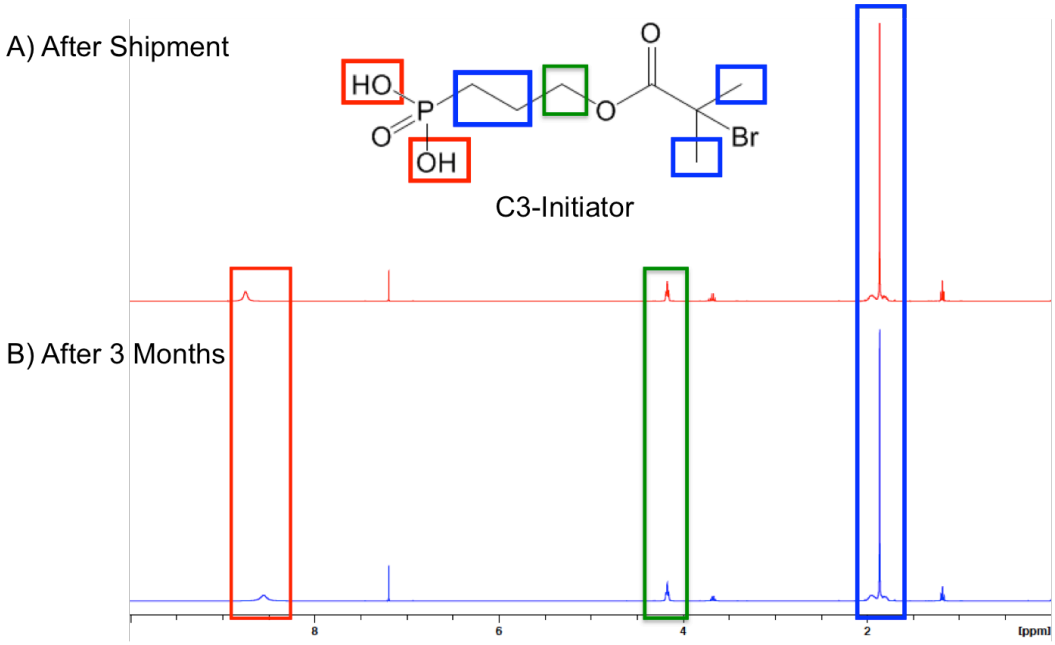

Figure S2: 1H NMR for C3-Initiator made A) after receiving product and B) after 3 months of storage at 4˚C. Notice that there does not appear to be any difference in the peaks over time (as compared to the C1-Initiator)

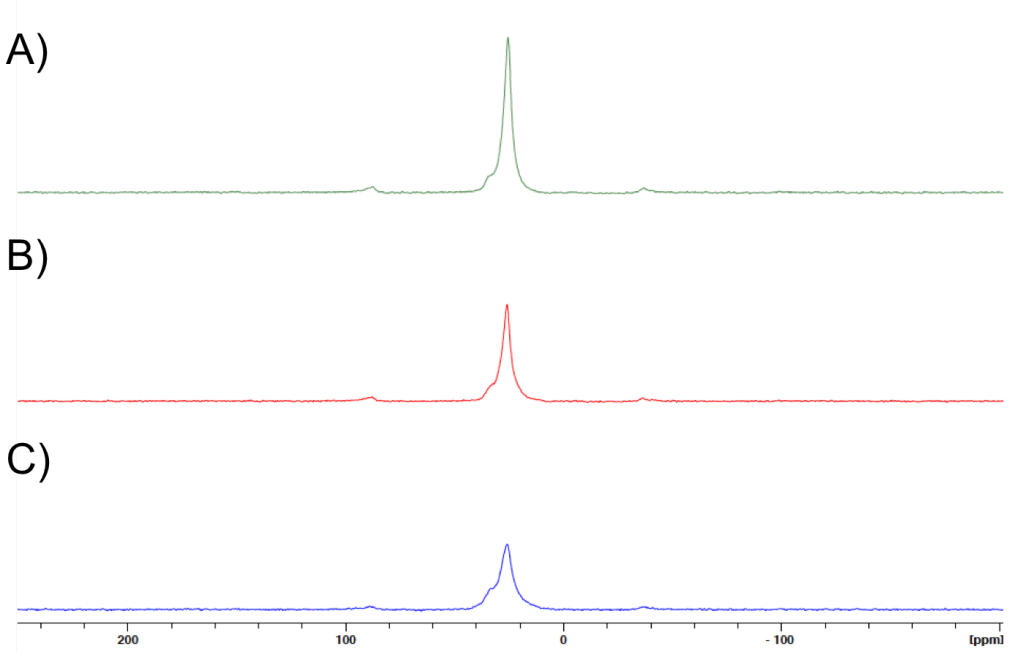

Figure S3: P31 solid state NMR spectra for P21 (Sigma) particles bound to C3-Initiator molecules – A) performed at room temperature (20˚C) for 2 hours, B) performed at 85˚C for 2 hours and C) performed at 85˚C for 2 hours, centrifuged and then heated at 155˚C for 4 hours.

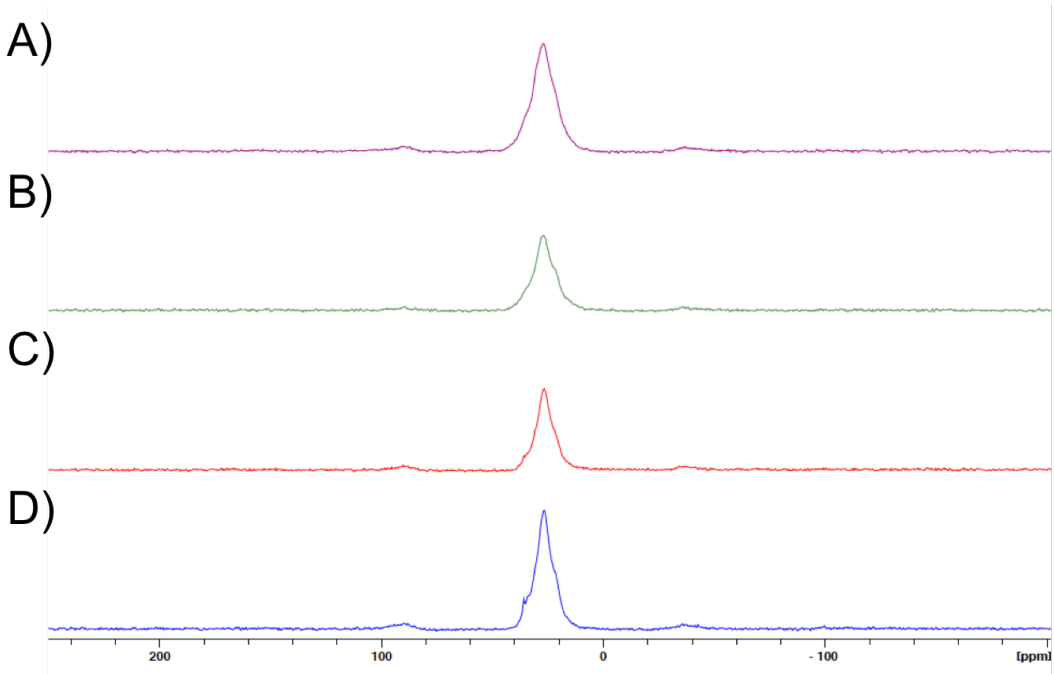

Figure S4: P31 solid state NMR for E40 (Evonik) particles bound with C3-Initiator molecules – A) performed at room temperature (20˚C) for 2 hours, B) performed at 85˚C for 2 hours, C) performed at 85˚C for 2 hours then centrifuged and heated at 155˚C for 4 hours, and D) performed at 85˚C for 2 hours then centrifuged and heated at 155˚C for 4 hours then washed with DI water and dried.

Table S1: XPS results for P21 (Sigma), E40 (Evonik) and Flat Titania Support bound with C3-Initiator without exposure to UV-light

Name	P21 + C3-Initiator	E40 + C3-Initiator	Flat Titania Surface + C3-Initiator
Al2p	1.2 %	1.46 %	1.56 %
Si2p			0.7 %
P2p	4.27 %	4.06 %	3.73 %
Br3p3	0.42 %	0.59 %	0.22 %
C1s	26.39 %	26.95 %	23.18 %
N1s	0.39 %	0.21 %	0.25 %
Ti2p	17.08 %	16.9 %	16.58 %
O1s	50.07 %	49.59 %	52.34 %

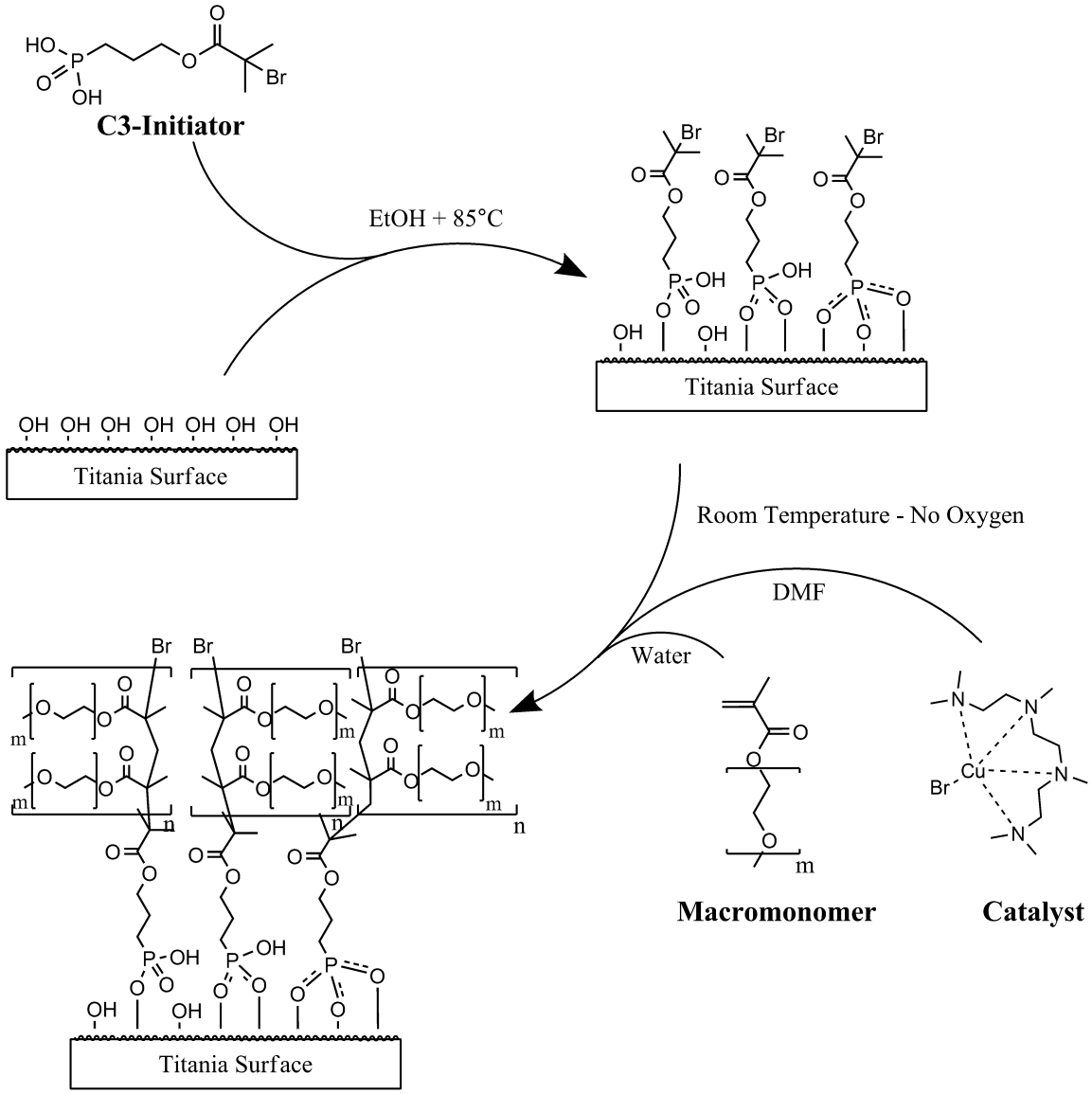

Figure S5: Master reaction schematic of the overall procedure from loading the C3-initiator onto the titania surface, to the resulting polymer film growth from the surface.

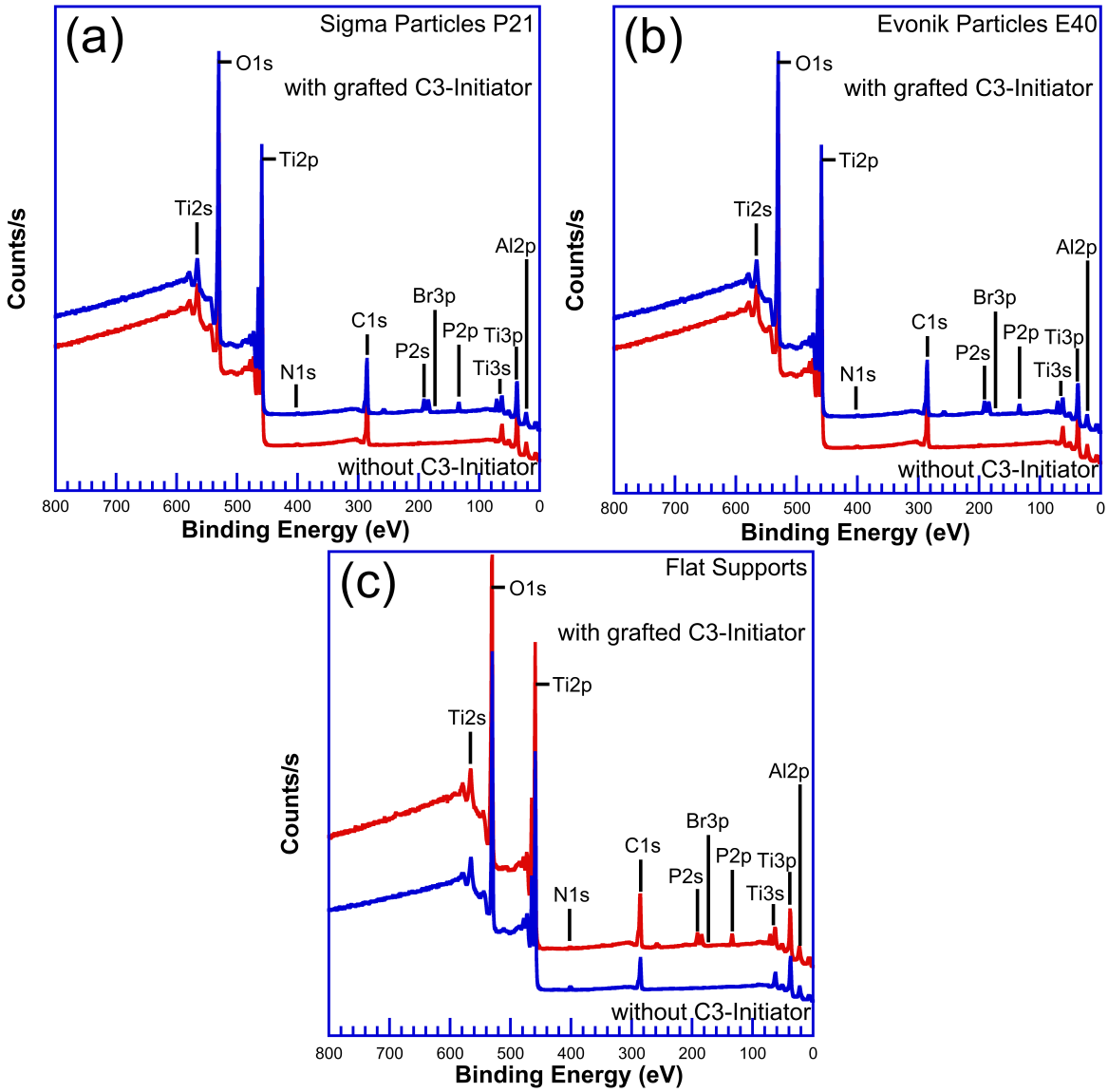

Figure S6: Full XPS spectras for (a) Sigma P21 particles, (b) Evonik E40 particles, and (c) flat titania support.