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SUPPORTING INFORMATION

Soft Polymeric Nanoparticles Additives for Next Generation Gas Separation Membranes

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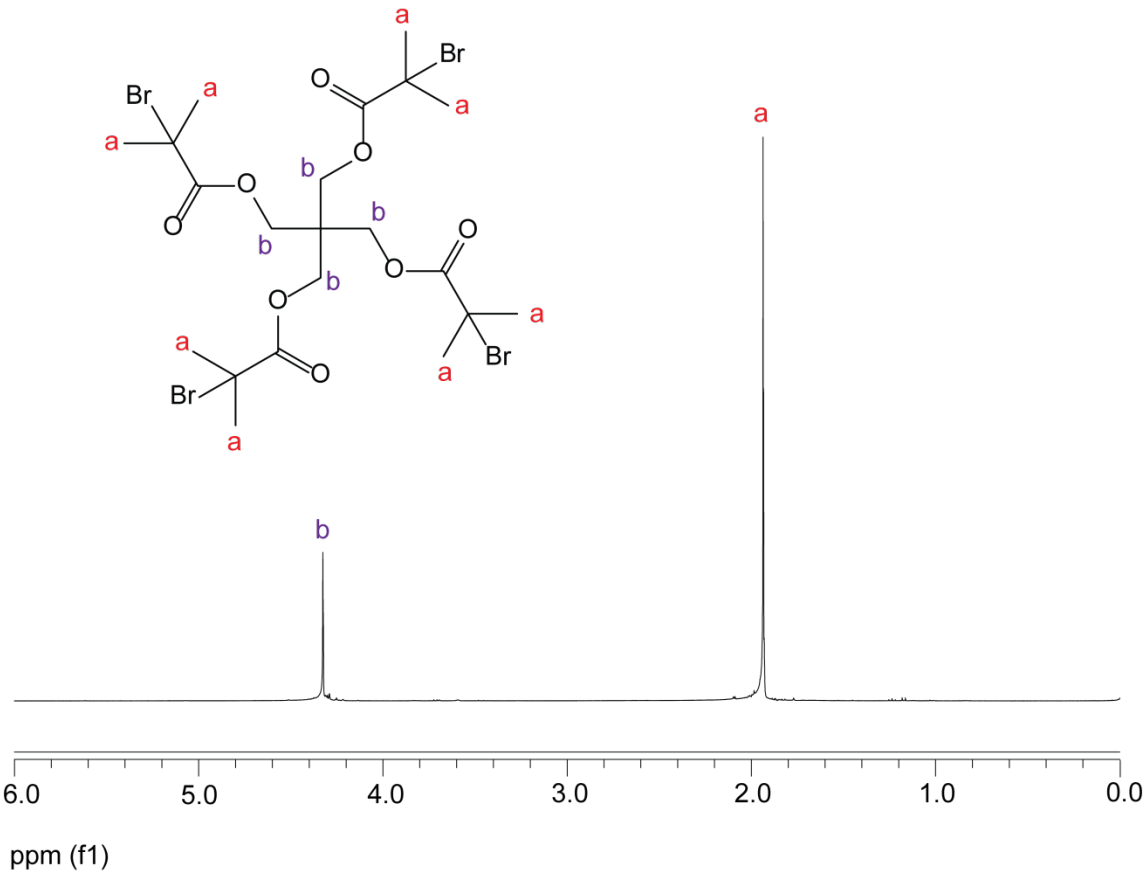

Figure S1. ^{1}H NMR spectra of tetra-functional initiator

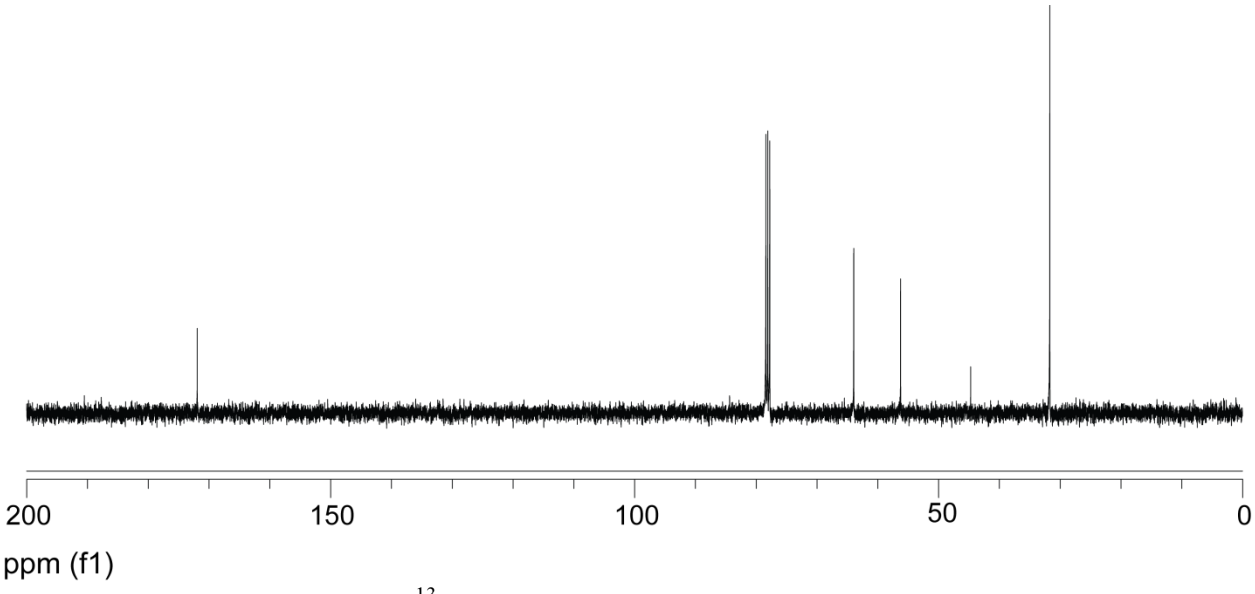

Figure S2. ^{13}C NMR spectra of tetra-functional initiator

Table S1 PDMS and PEG weight fraction of the synthesized grafted star polymers.

Polymer	wt.% PDMS Block	wt.% PEG Block
$\mathbf{P0_{24/0}}$	0	100
$\mathbf{P2_{10/72}}$	14	86
$\mathbf{P2_{10/24}}$	39	61
$\mathbf{P2_{30/24}}$	67	33

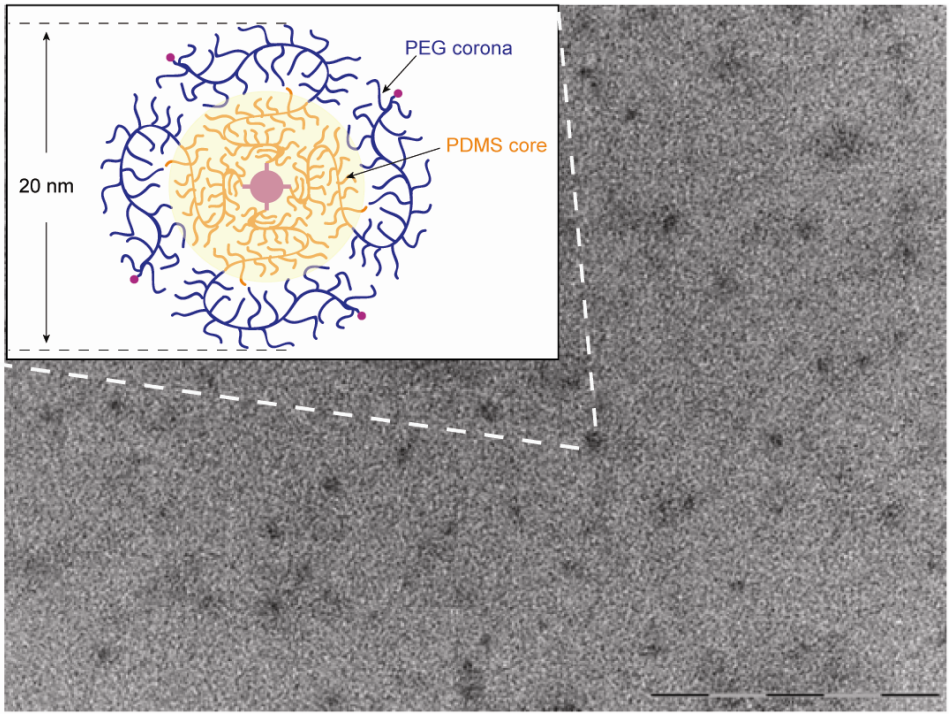

Figure S3. TEM image of $\mathbf{P2_{24/30}}$. Scale bar = 500 nm.

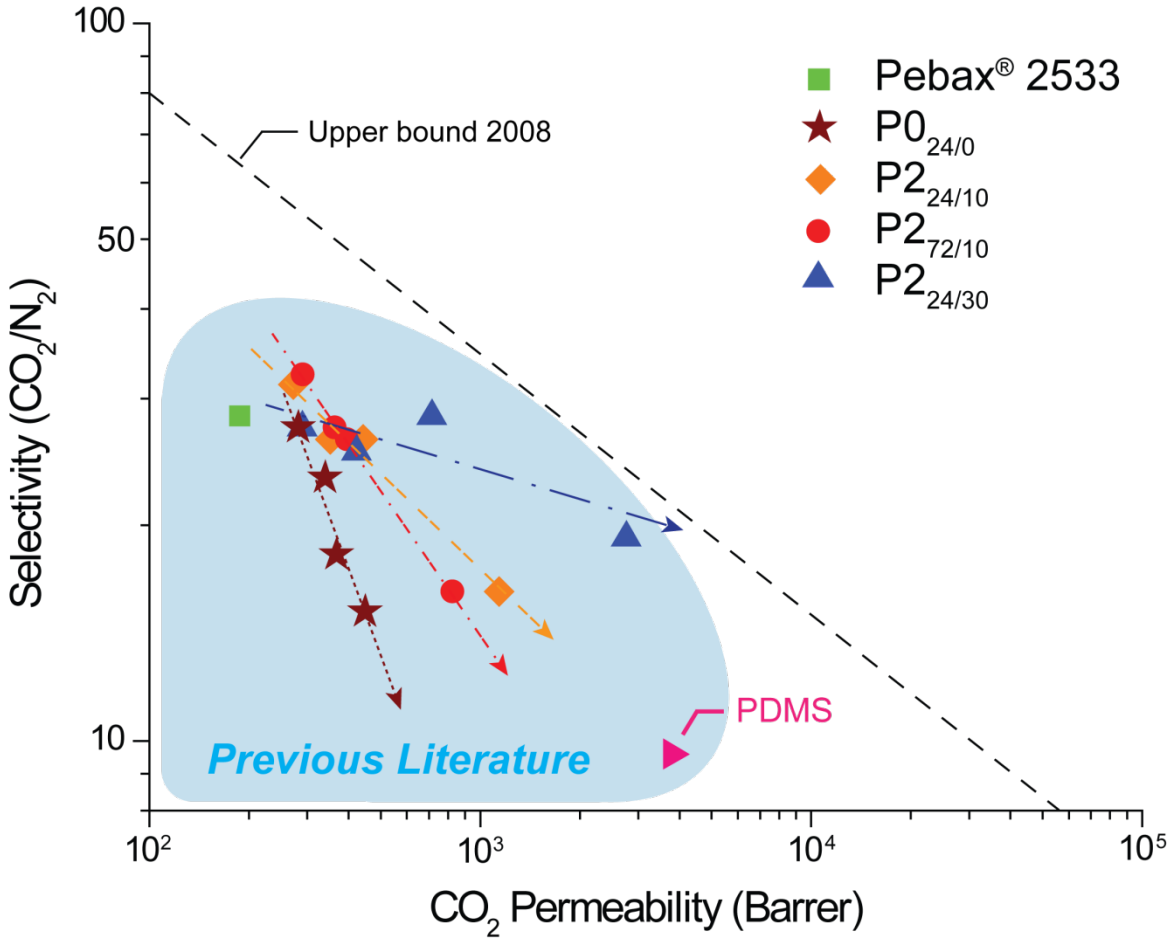

Figure S4. CO_2/N_2 selectivity as a function of CO_2 permeability plotted against the updated upper bound for the active layers developed in this study, as well as literature results for PDMS and Pebax® 2533 membranes. The arrow indicates increasing grafted star polymers mass fraction.