Supporting Information

Functional α,ω-dienes via thiol-Michael coupling chemistry: synthesis, oxidative protection and acyclic diene metathesis (ADMET) polymerization.

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Additional $^1$H, $^{13}$C and $^{19}$F NMR spectra of compounds and polymers

11-bromoundec-1-ene (A)

2-(undec-10-en-1-yl)tridec-12-enoic acid (D)
2-(undec-10-en-1-yl)tridec-12-en-1-ol (E)

2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(benzylthio)propanoate (Ft3)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate (OxFt1)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)sulfonyl)propanoate (OxFt2)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(benzylsulfonyl)propanoate (OxFt3)

![Chemical structure of OxFt3]

2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate (OxFt4)

![Chemical structure of OxFt4]
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate) Poly(OxFt1)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl)sulfonyl)propanoate) Poly(OxFt2)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate) Poly(OxFt1) thiol-ene modified with benzyl mercaptan (t3)

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10 –heptadeca fluorodecyl)sulfonyl)propanoate) Poly(OxFt2) thiol-ene modified with benzyl mercaptan (t3)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-y1 3-(benzylsulfonyl)propanoate) Poly(OxFt3) thiol-ene modified with benzyl mercaptan (t3)

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-y1 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with benzyl mercaptan (t3)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with 2-mercaptoethanol (t6)

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with 1-thio-β-D-glucose tetraacetate (t7)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with mercaptopropylisobutyl-POSS® (t8)

Disappearance of 'ene'

ppm
2 Additional SEC traces of polymers

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate) Poly(OxFt1)

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10-heptadecafluorodecyl)sulfonyl)propanoate) Poly(OxFt2)

NB: peak convoluted
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4)

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate) Poly(OxFt1)

thiol-ene modified with benzyl mercaptan (t3)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10 –heptadeca fluorodecyl)sulfonyl)propanoate) Poly(OxFt2) thiol-ene modified with benzyl mercaptan (t3)

![Graph 1](image1)

LogM

\[ \frac{\text{dw}}{\text{dLogM}} \]

\[ M_n = 4,500 \]

\[ D_m = \]

NB: peak convoluted

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(benzylsulfonyl)propanoate) Poly(OxFt3) thiol-ene modified with benzyl mercaptan (t3)

![Graph 2](image2)

LogM

\[ \frac{\text{dw}}{\text{dLogM}} \]

\[ M_n = 16,400 \]

\[ D_m = 2.01 \]
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with benzyl mercaptan (t3)

\[
\begin{align*}
\log M & = 4.0 \\
\frac{d\log M}{dM} & = 1.0 \\
M_n & = 16,200 \\
\mathcal{D}_m & = 2.05
\end{align*}
\]

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with 2-mercaptoethanol (t6)

\[
\begin{align*}
\log M & = 4.0 \\
\frac{d\log M}{dM} & = 1.0 \\
M_n & = 12,900 \\
\mathcal{D}_m & = 1.84
\end{align*}
\]
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-y1 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with 1-thio-β-D-glucose tetraacetate (t7)

![Gel permeation chromatography (GPC) trace](image1)

- $M_n = 18,800$
- $D_m = 2.08$

Poly(2-(undec-10-en-1-yl)tridec-12-en-1-y1 3-(dodecylsulfonyl)propanoate) Poly(OxFt4) thiol-ene modified with mercaptopropylisobutyl-POSS® (t8)

![Gel permeation chromatography (GPC) trace](image2)

- $M_n = 20,300$
- $D_m = 1.87$
3 FTIR spectra of compounds and polymers

2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate (OxFt1)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,7,8,8,9,9,10,10,10-heptadecafluorodecyl)sulfonyl)propanoate (OxFt2)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(benzylsulfonyl)propanoate (OxFt3)
2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate (OxFt4)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((2,2,2-trifluoroethyl)sulfonyl)propanoate) Poly(OxFt1)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-((3,3,4,4,5,5,6,7,8,8,9,9,10,10,10-heptadecafluorodecyl)sulfonyl)propanoate) Poly(OxFt2)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(benzylsulfonyl)propanoate) Poly(OxFt3)
Poly(2-(undec-10-en-1-yl)tridec-12-en-1-yl 3-(dodecylsulfonyl)propanoate) Poly(OxFt4)