Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

The development of bio-acrylic polymers from Cyrene™: transforming a green solvent to a green polymer

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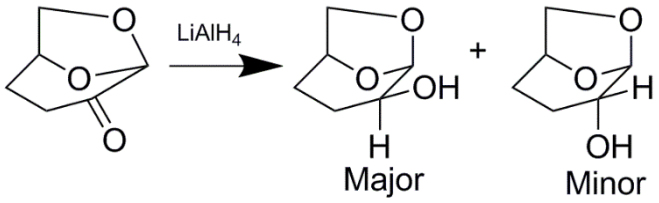


Fig. S1 Stereo centers of Levoglucosanol (Cyrene-OH)

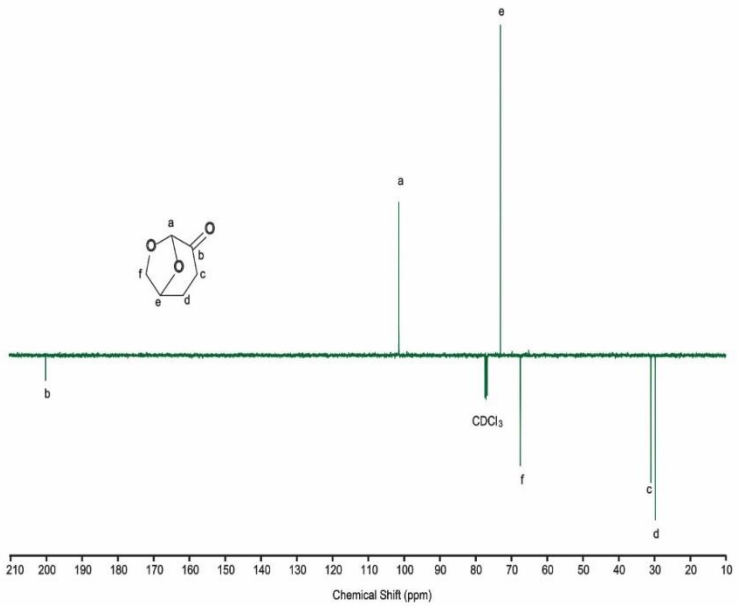


Fig S2 ^{13}C NMR of Cyrene

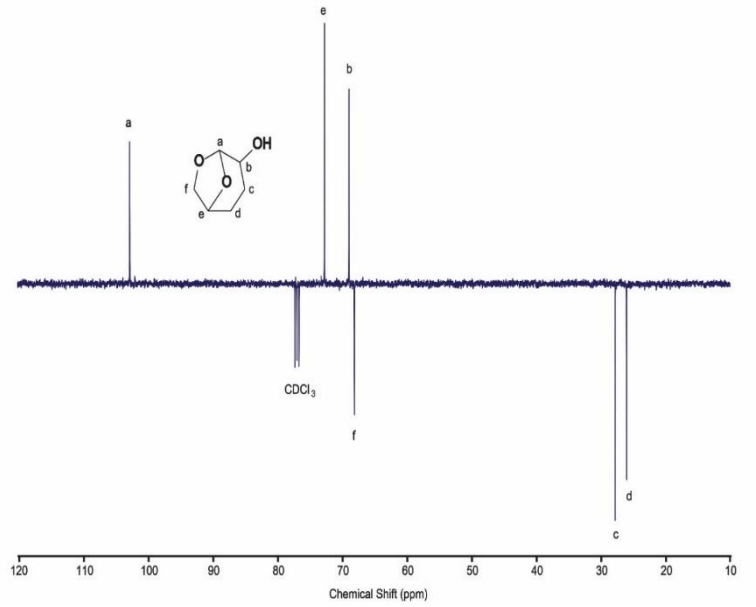


Fig S3 ^{13}C NMR of Cyrene-OH

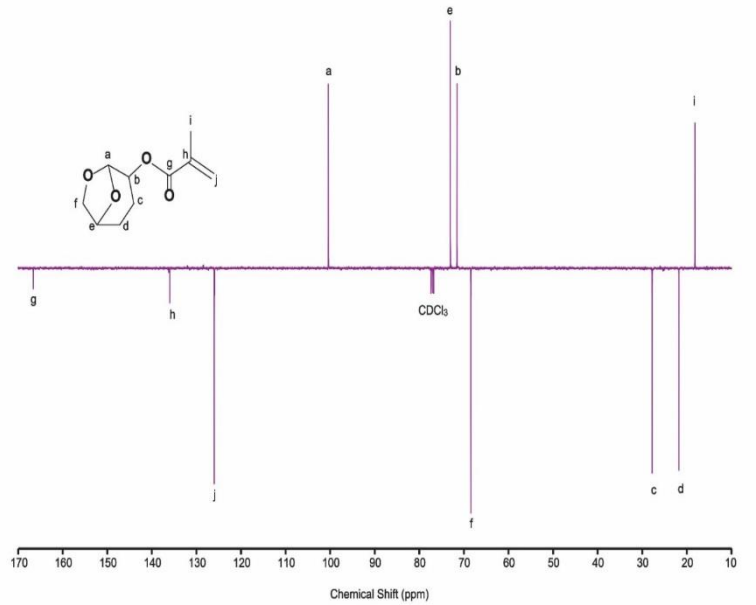


Fig. S4 ^{13}C NMR of m-Cyrene

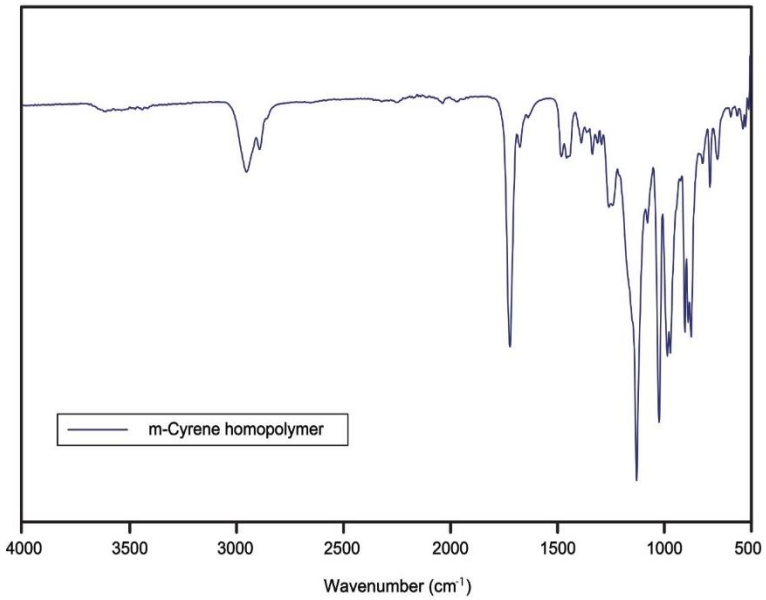


Fig. S5 ATR-FTIR spectrum of m-Cyrene homopolymer

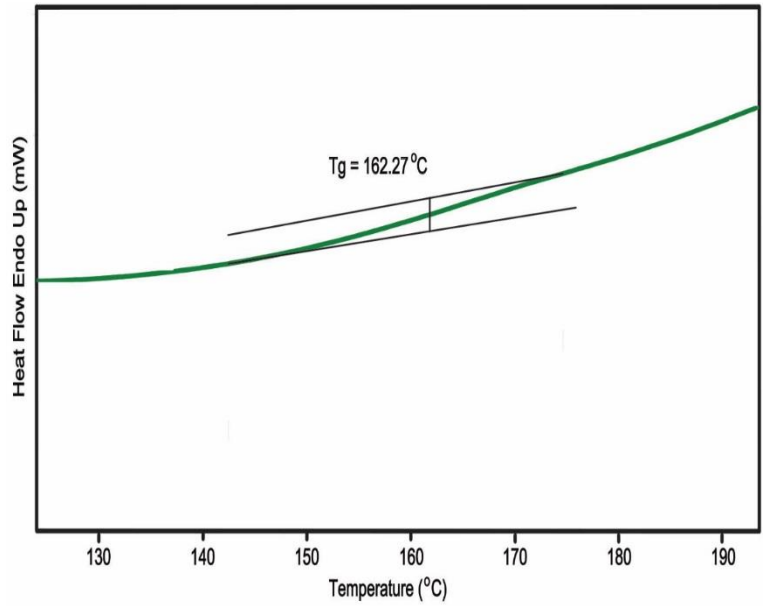


Fig. S6 DSC analysis of m-Cyrene homopolymer from bulk polymerization

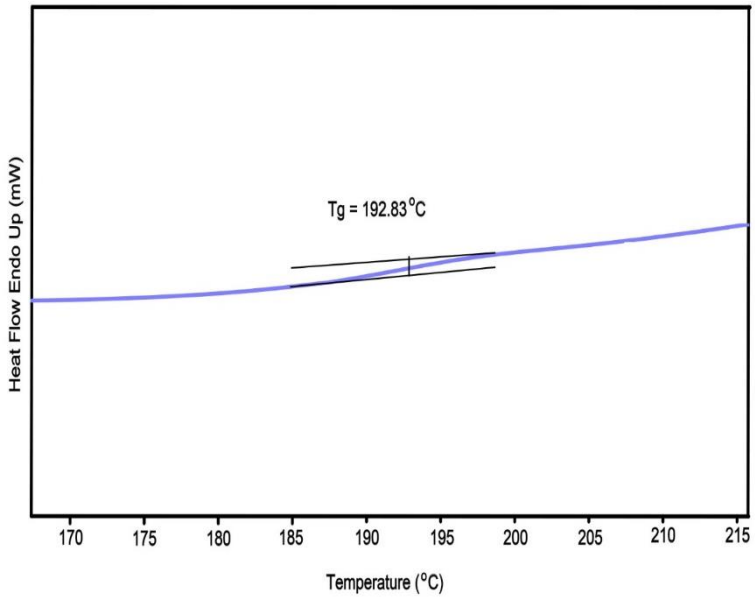


Fig. S7 DSC analysis of m-Cyrene homopolymer by emulsion polymerization

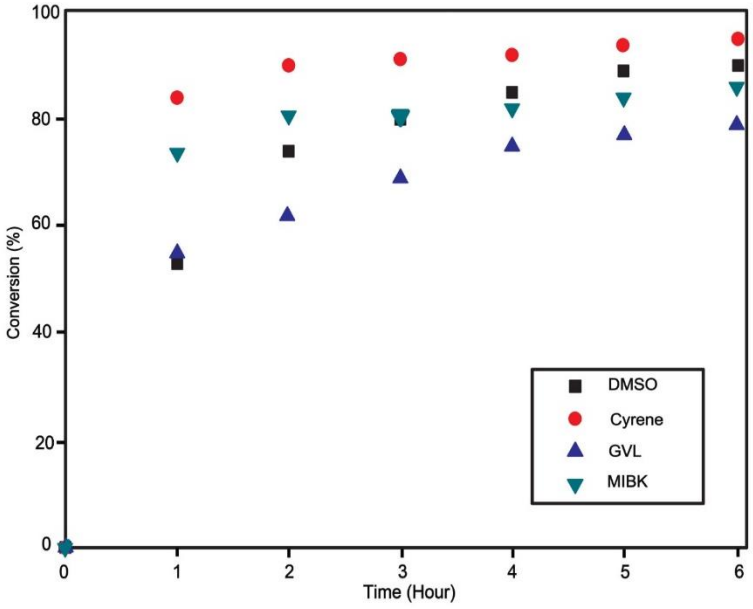


Fig. S8 Polymerization kinetics of m-Cyrene in different solvents

Reactivity ratio calculation using Fineman-Ross (F-R) and Kelen-Tüdös (K-T) models

F-R model $G = r_1 H - r_2$ (1)

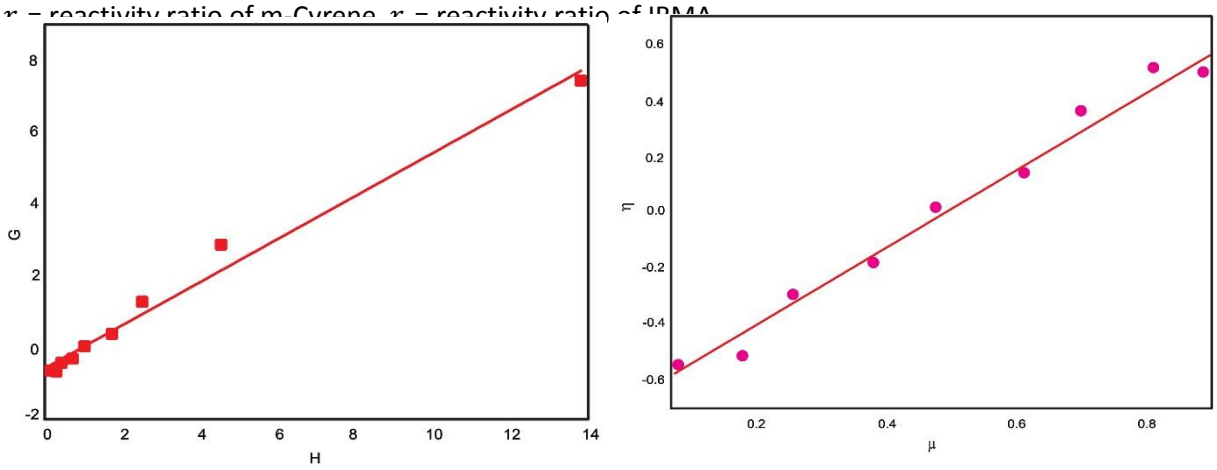
K-T model $\eta = \left[r_1 + {}^{r_2}/_{\alpha}\right]\mu - \frac{r_2}{\alpha}$

where, $G = F(f-1)/f$, $H = F^2/f$, $\eta = G/(\alpha + H)$, $\mu = H/(\alpha + H)$, $F = M_1/M_2$, $f = m_1/m_2$

$\alpha = (H_{max}H_{min})^{1/2}$, M_1= mole fraction of m-Cyrene in feed, M_2= mole fraction of IBMA in feed,

m_1= mole fraction of m-Cyrene in copolymer, m_2= mole fraction of IBMA in copolymer,

r_1 = reactivity ratio of m-Cyrene, r_2 = reactivity ratio of IBMA



(a) (b)

Fig. S9 (a) F-R model and (b) K-T model

In F-R and K-T models, G is plotted against H (Fig S8.a) and η is plotted against μ (Fig S8.b) respectively. G vs H plot gives a straight line with r_1 as slope and $-r_2$ as the intercept. Similar plot of η vs μ provides $\left[r_1 + {}^{r_2}/_{\alpha}\right]$ as a slope and $(-r_2/\alpha)$ as its intercept.