Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting information

Thermoreversible Cross-Linking of Ethylene/Propylene Copolymers Based on Diels–Alder Chemistry: The Cross-Linking Reaction Kinetics

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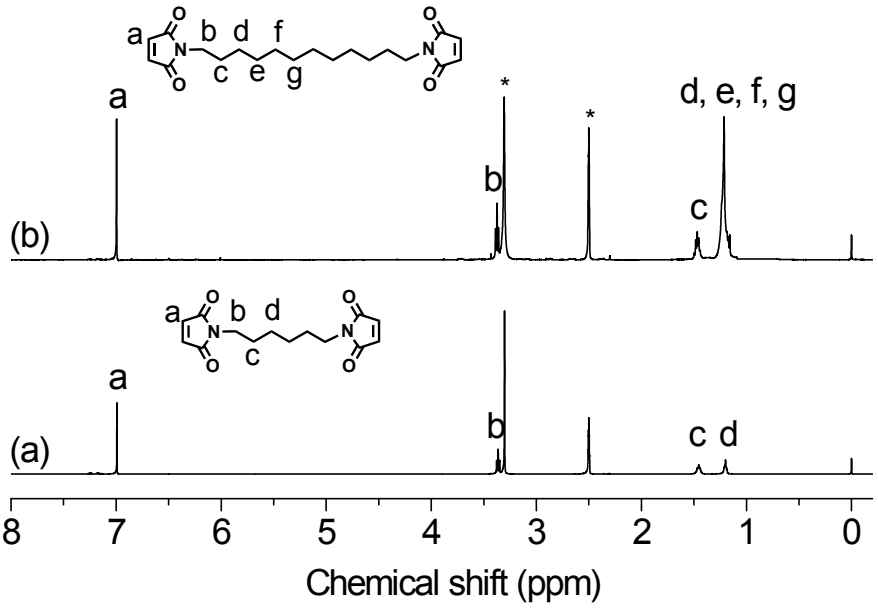

Figure S1 ^{1}H NMR spectra of (a) 1,6-dimaleimide hexane (C6) and (b) 1,12-bismaleimide dodecane (C12) (solvent: DMSO-d_6)

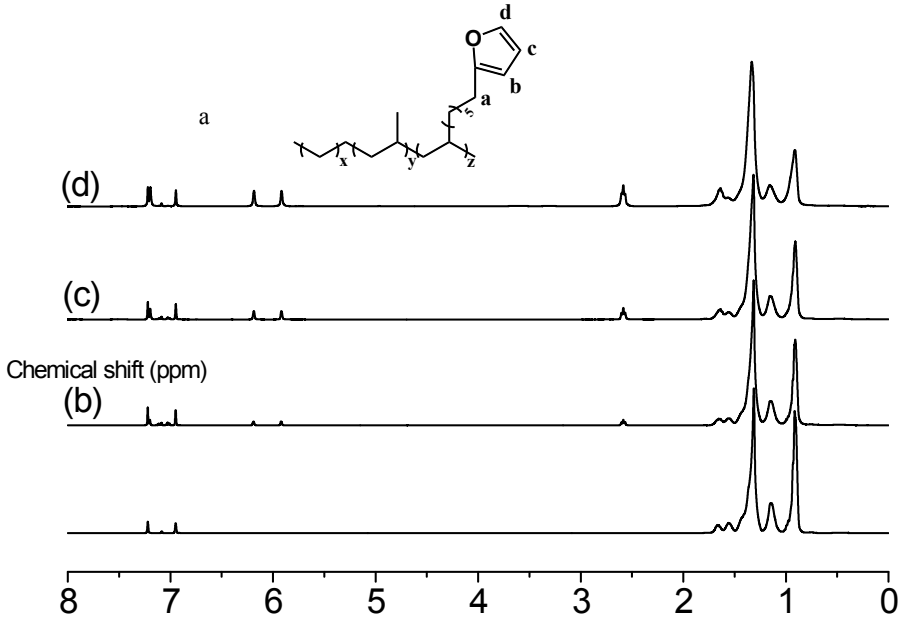

Figure S2 ^{1}H-NMR spectra of (a) the ethylene/propylene copolymer (Run 1 in Table 1) and the ethylene/propylene/FO copolymer with FO insertion ratio of (b) 2.25 mol%, (c) 4.59 mol% and (d) 9.79 mol% (Runs 2-4 in Table 1) (solvent: 1,2-dichlorobenzene-d_4)

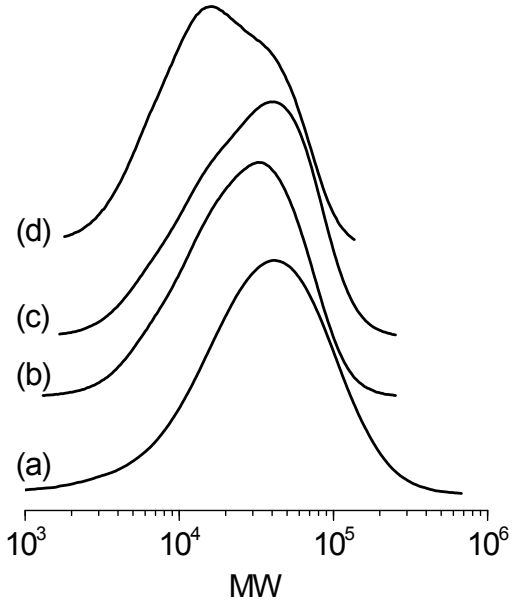

Figure S3 GPC curves of (a) the ethylene/propylene copolymer (Run 1 in Table 1) and the ethylene/propylene/FO copolymer with FO insertion ratio of (b) 2.25 mol%, (c) 4.59 mol% and (d) 9.79 mol% (Runs 2-4 in Table 1)

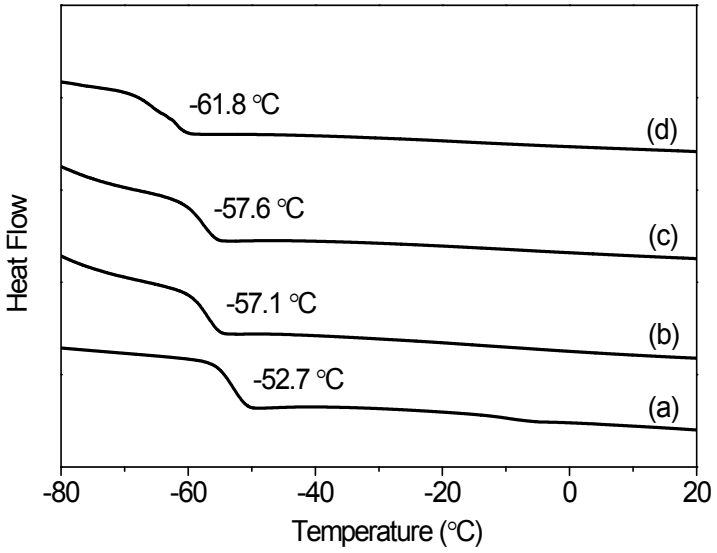

Figure S4 DSC curves of (a) the ethylene/propylene copolymer (Run 1 in Table 1) and the ethylene/propylene/FO copolymer with FO insertion ratio of (b) 2.25 mol%, (c) 4.59 mol% and (d) 9.79 mol% (Runs 2-4 in Table 1) with the feeding ratio of E/P = 1 in gas

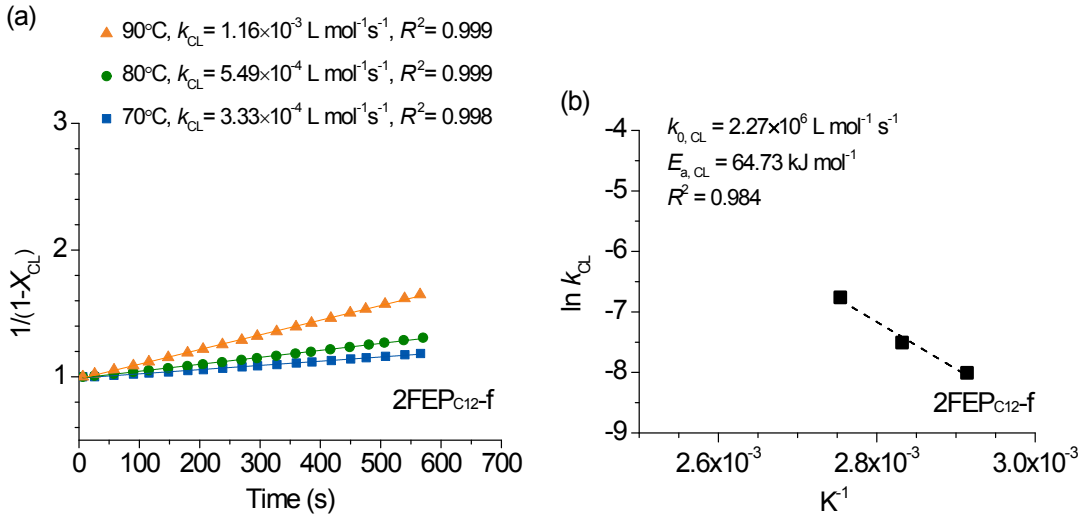

Figure S5 Specimen 2FEP$_{C12}$-f: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 70°C, 80°C and 90°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

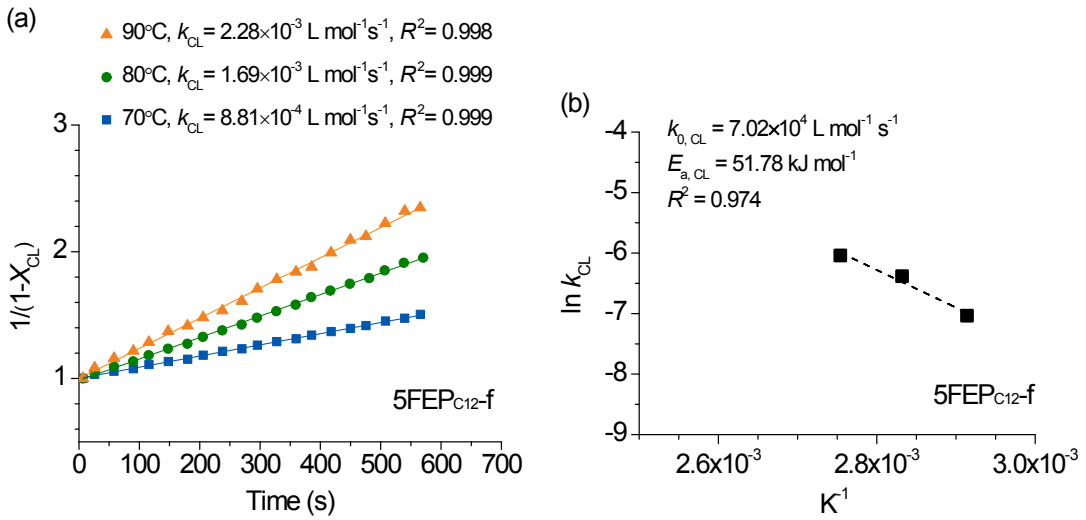

Figure S6 Specimen 5FEP$_{C12}$-f: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 70°C, 80°C and 90°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

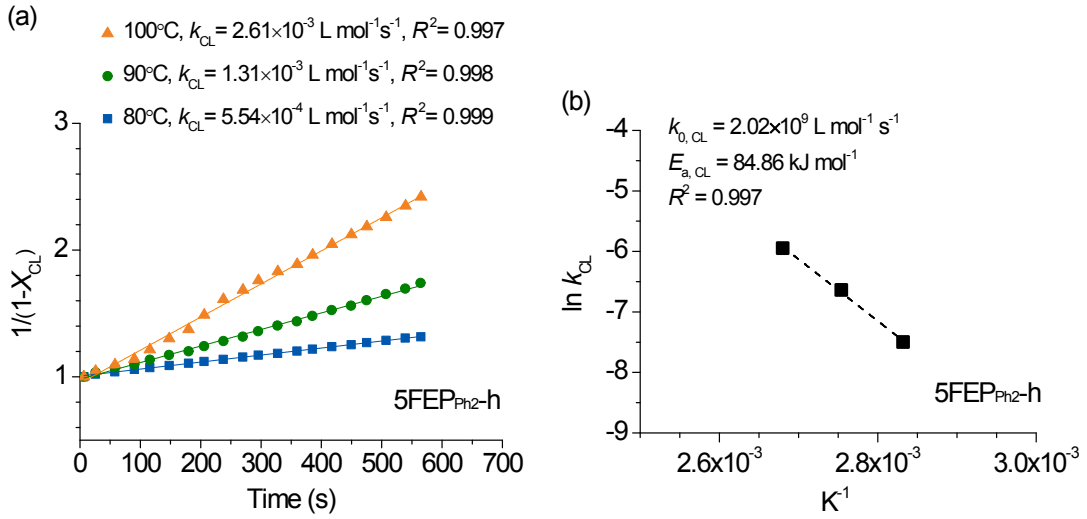

Figure S7 Specimen 5FEP$_{Ph2}$-h: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 80°C, 90°C and 100°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

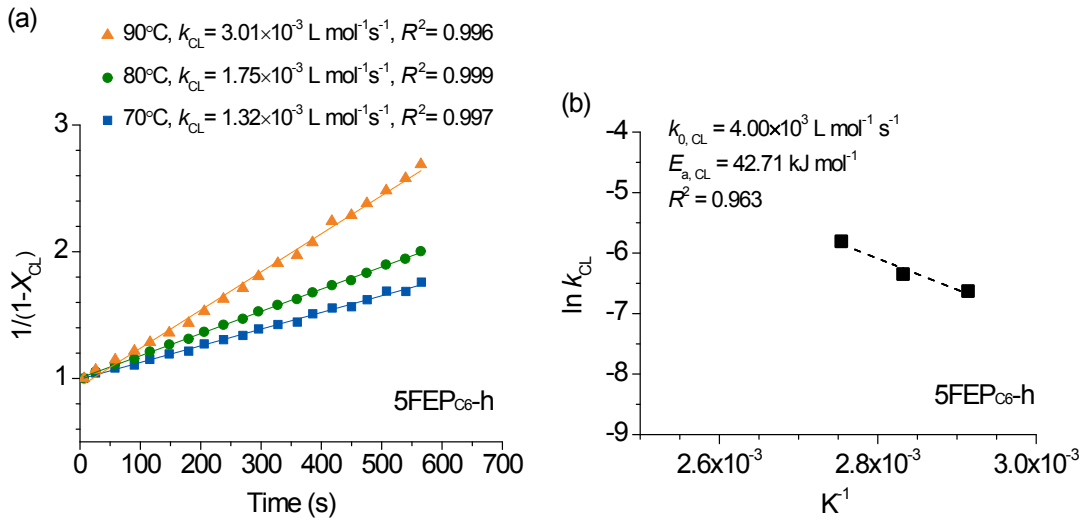

Figure S8 Specimen 5FEP$_{C6}$-h: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 70°C, 80°C and 90°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

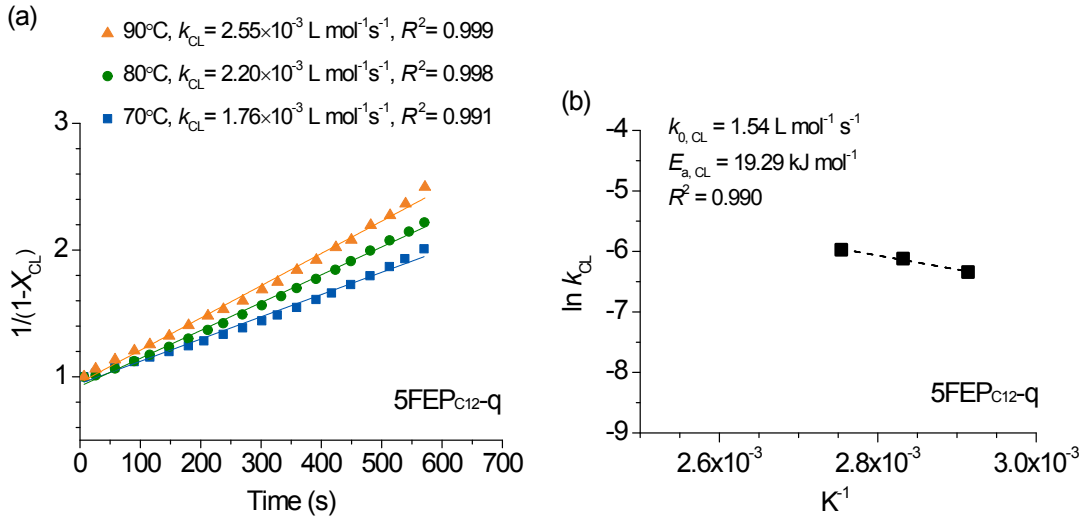

Figure S9 Specimen 5FEP$_{C12}$-q: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 70°C, 80°C and 90°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

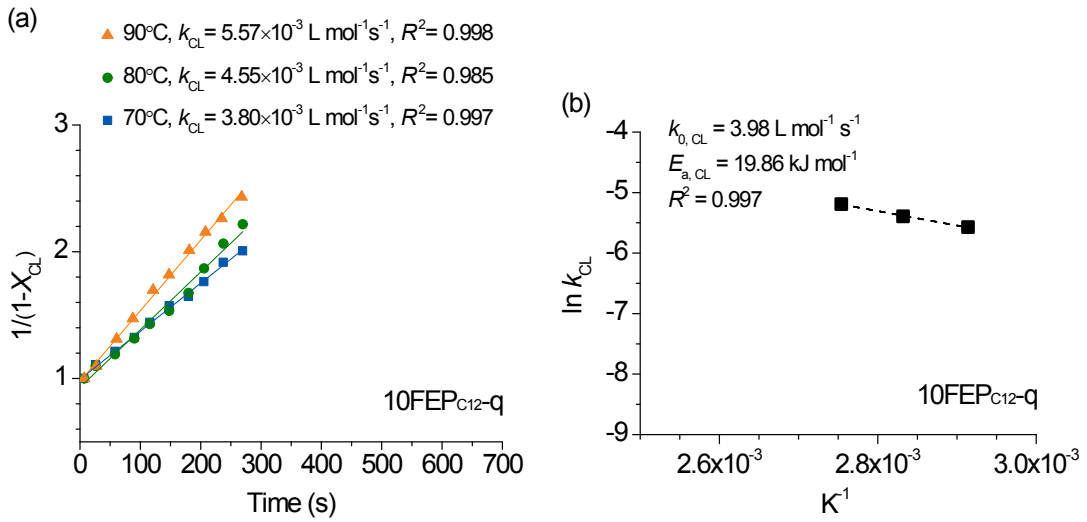

Figure S10 Specimen 10FEP$_{C12}$-q: (a) fitting the initial stage (first 10 min) of the cross-linking conversion data to second order reaction kinetics to determine k_{CL} at 70°C, 80°C and 90°C; (b) Arrhenius plots to determine the $k_{0,CL}$ and $E_{a,CL}$ of the cross-linking reaction

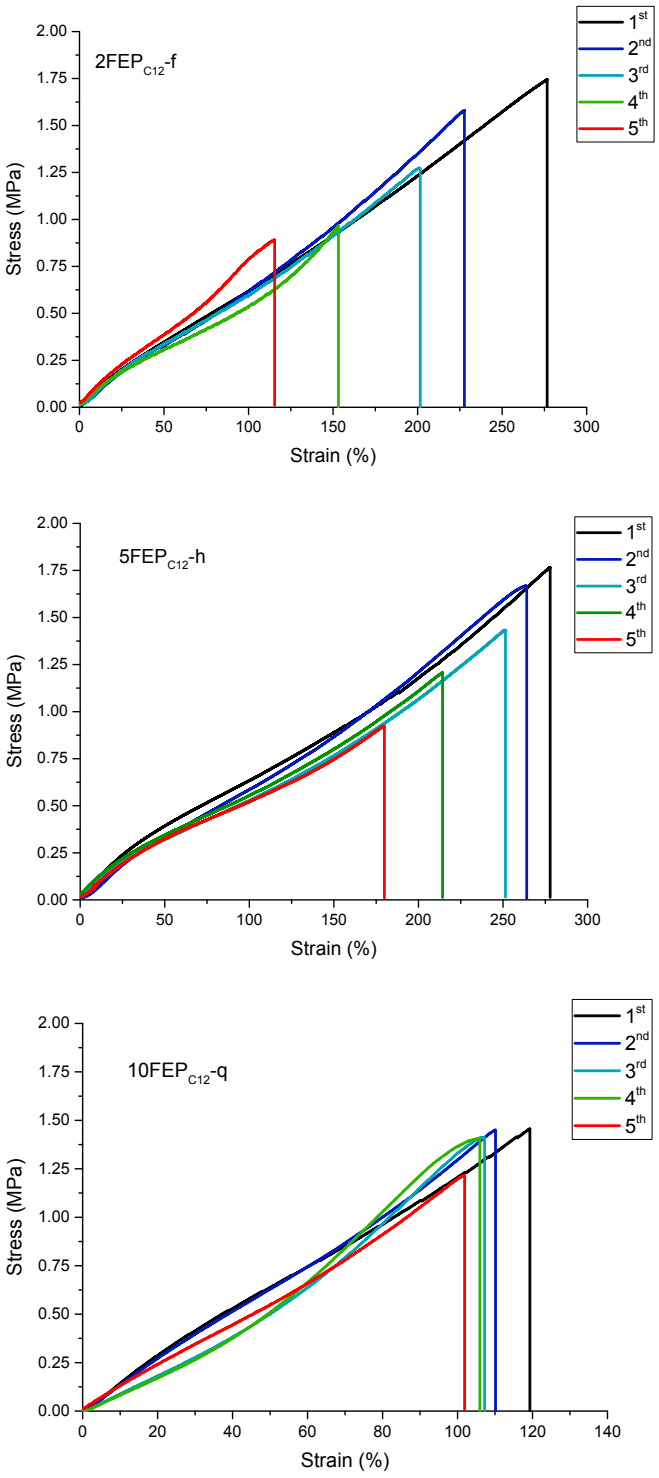

Figure S11 Stress-strain curves of the thermoreversibly cross-linked EPR under five repeated processing cycles