SUPPORTING INFORMATION FOR MANUSCRIPT ENTITLED:

Star Polymers and Polymer Networks Containing a Novel, Hydrolyzable Diacetal-Based Dimethacrylate Cross-Linker: Synthesis, Characterization and Hydrolysis Kinetics

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The $^1$H and $^{13}$C NMR spectra of the purified MOEME cross-linker are displayed in Figure S1:

Figure S1. $^1$H and $^{13}$C NMR spectra of the bis[(2-methacryloyloxy)ethoxymethyl]ether (MOEME) cross-linker in CDCl$_3$.

MOEME: $^1$H NMR (CDCl$_3$, $\delta$): 1.91 [s, 2(CH$_3$C), 6 H], 3.79 [t, (OCH$_2$CH$_2$OCH$_2$)$_2$O, 4 H], 4.27 [t, (OCH$_2$CH$_2$OCH$_2$)$_2$O, 4 H], 4.78 [s, (OCH$_2$CH$_2$OCH$_2$)$_2$O, 4 H], 5.55 (s, olefinic H trans to CO$_2$, 2 H), 6.09 (s, olefinic H cis to CO$_2$, 2 H). $^{13}$C NMR (CDCl$_3$, $\delta$): 19 [s, CH$_3$C(=CH$_2$), 2 C], 64 [s, (OCH$_2$CH$_2$OCH$_2$)$_2$O, 2 C], 67 [s, (OCH$_2$CH$_2$OCH$_2$)$_2$O, 2 C], 92 (s, -OCH$_2$O-, 2 C), 126 (s, CH$_2$=C, 2 C), 136 [s, CH$_3$C(=CH$_2$), 2 C], 168 [s, OC(=O)C, 2 C].
Figure S2 shows the time dependence of the relative concentration (fraction) of the unreacted DMOEM and MOEME cross-linkers ($A/A_0$) during the course of their acid hydrolysis.

**Figure S2.** Time-dependence of the fraction of the non-hydrolyzed cross-linkers di(methacryloyloxy-1-ethoxy)methane (DMOEM) and bis[(2-methacryloyloxy)ethoxymethyl]ether (MOEME) ($A/A_0$) during the course of their hydrolysis.

The fraction of unreacted cross-linkers (DMOEM or MOEME) present in the reaction solution at each reaction time was calculated from the ratio of the area of the $^1$H NMR peak of the cross-linker esteric methylene protons (~4.1 ppm) divided by the sum of the areas of these protons plus the HEMA (hydrolysis product) esteric methylene protons (~4.0 ppm). The insets are the semilogarithmic concentration vs. time plots, which give straight lines, thus confirming pseudo-first-order hydrolysis kinetics.