Electronic Supplementary Material (ESI) for Polymer Chemistry.


# Supporting Information for

## On Photopolymerization of Mevalonic Lactone Methacrylate: Exposing the Potential of an Overlooked Monomer

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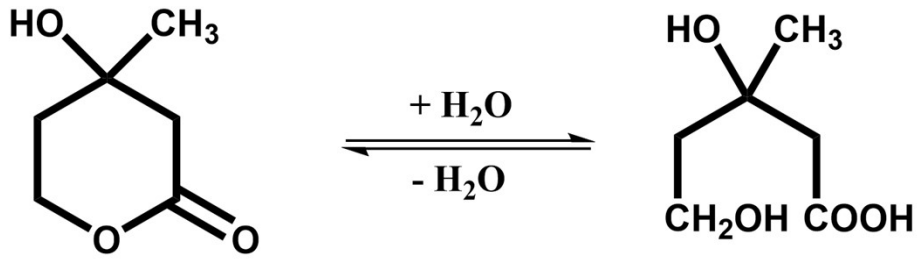
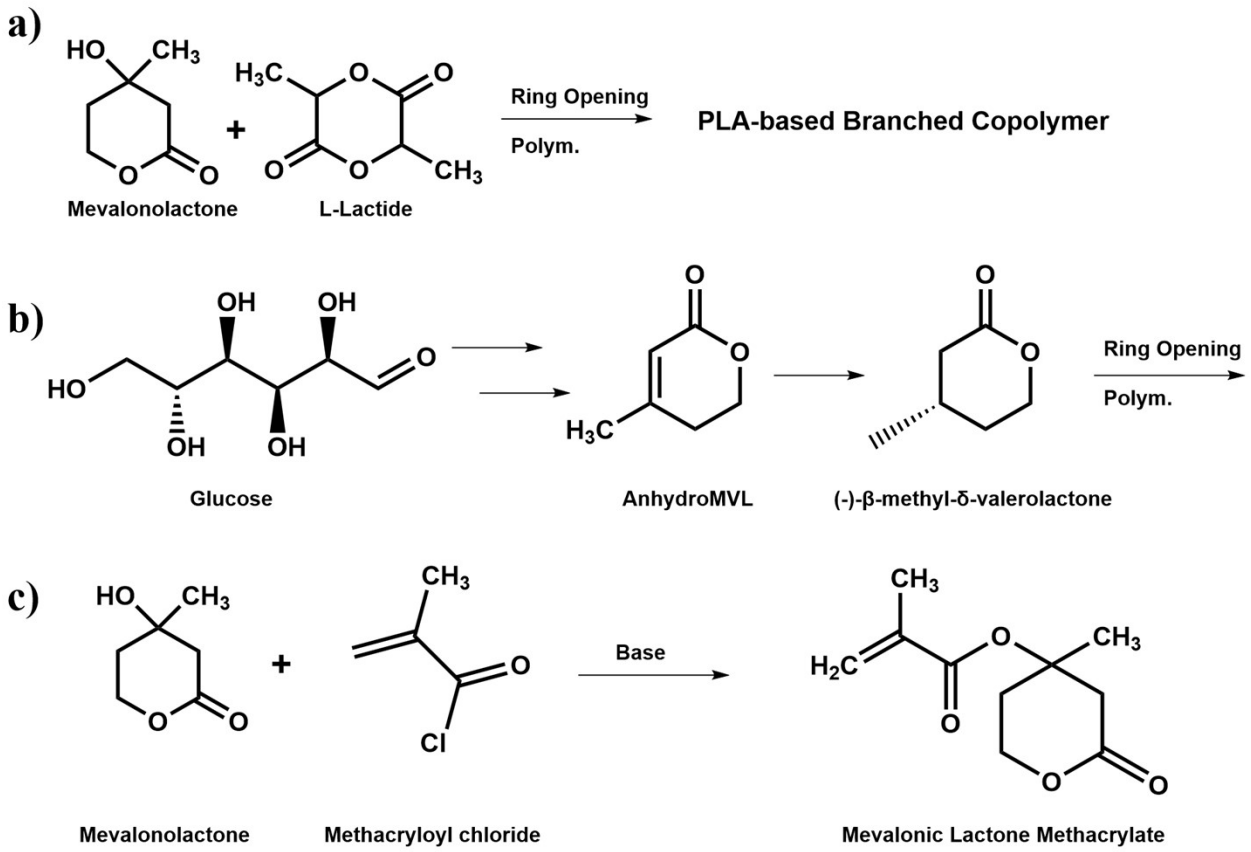



**Mevalonolactone** **Mevalonic Acid**

**Scheme S1.** Chemical structures of mevalonolactone (MVL) and mevalonic acid.




**Scheme S2.** Literature summary on polymerizable MVL products, a) Ring opening copolymerization of MVL with L-lactide to produce biodegradable PLA-based branched copolymers,[1] b) scalable biosynthesis of (-)-β-methyl-δ-valerolactone monomer from glucose via anhydroMVL intermediate,[2] c) synthesis of mevalonic lactone methacrylate (MVLMA) that was copolymerized with 2-methyl-2-adamantane via thermal initiation.[3]

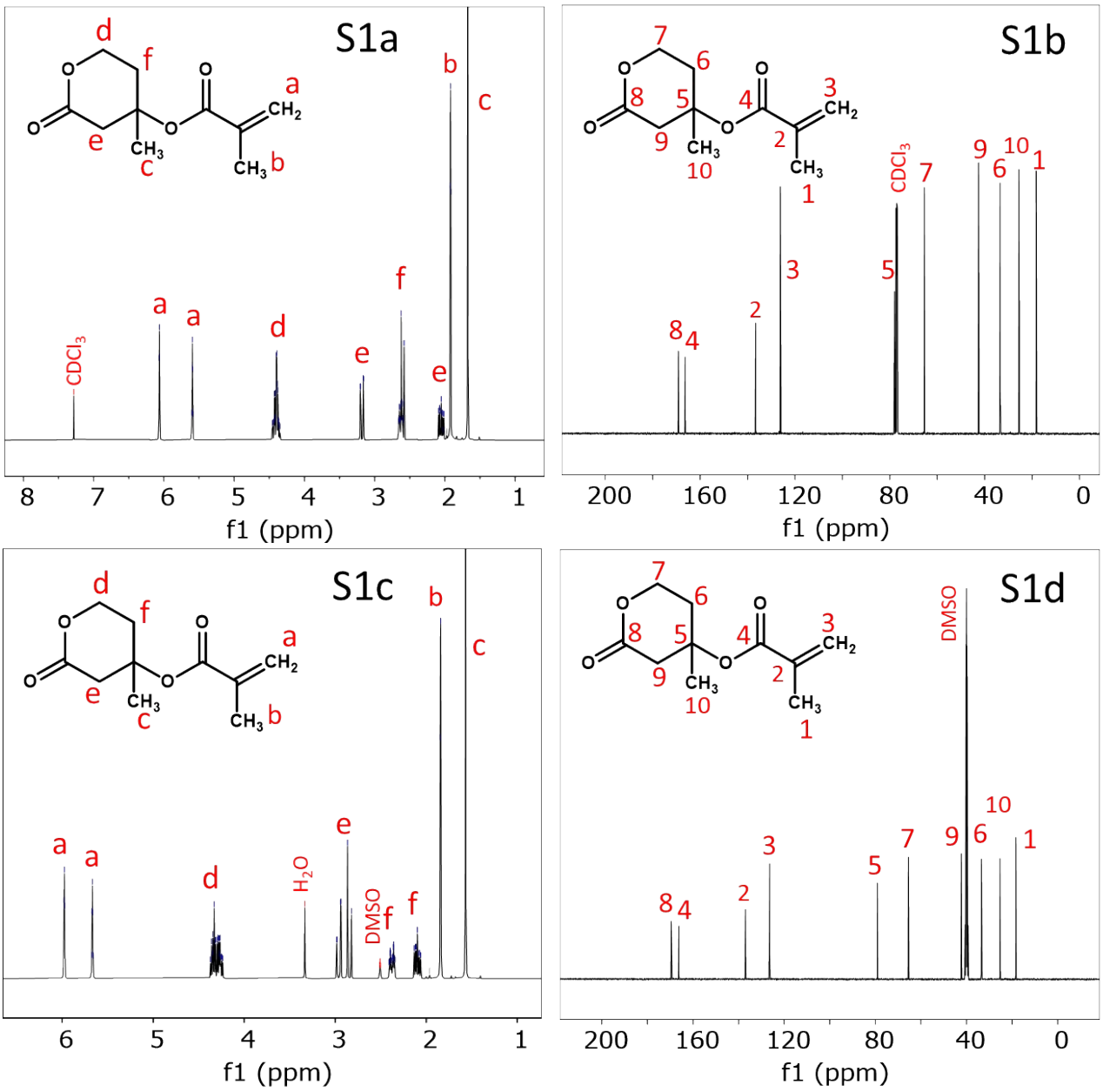



**Figure S1.** $^{1}H$ NMR and $^{13}C$ NMR results of MVLMA prepared in $CDCl_3$ (S1a,b) and DMSO (S1a,b). s

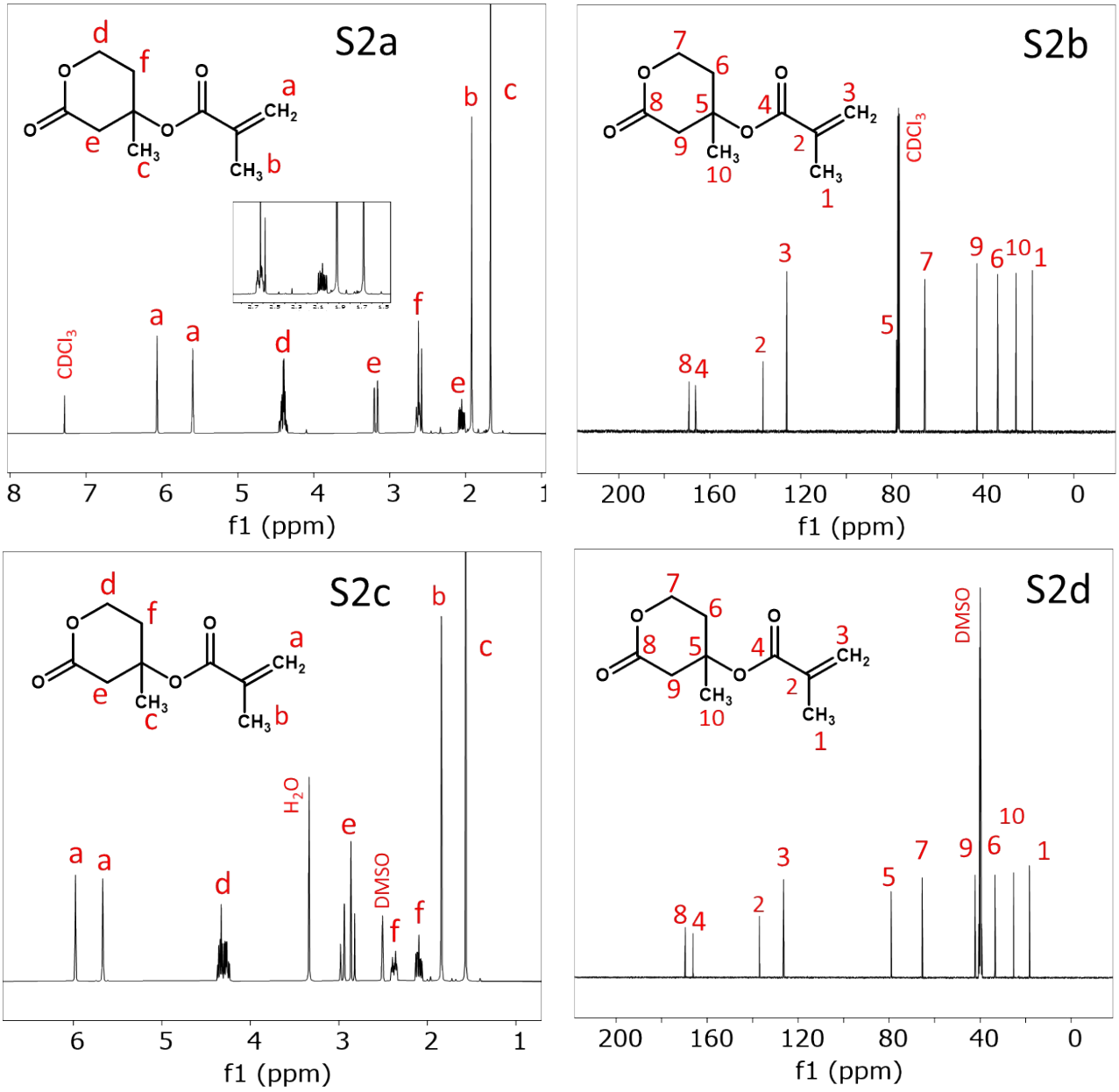



**Figure S2.** $^{1}H$ NMR and $^{13}C$ NMR results of MVLMA prepared in $CDCl_3$ (S2a,b) and DMSO (S2c,d) after being exposed to UV light irradiation for 16 hours.

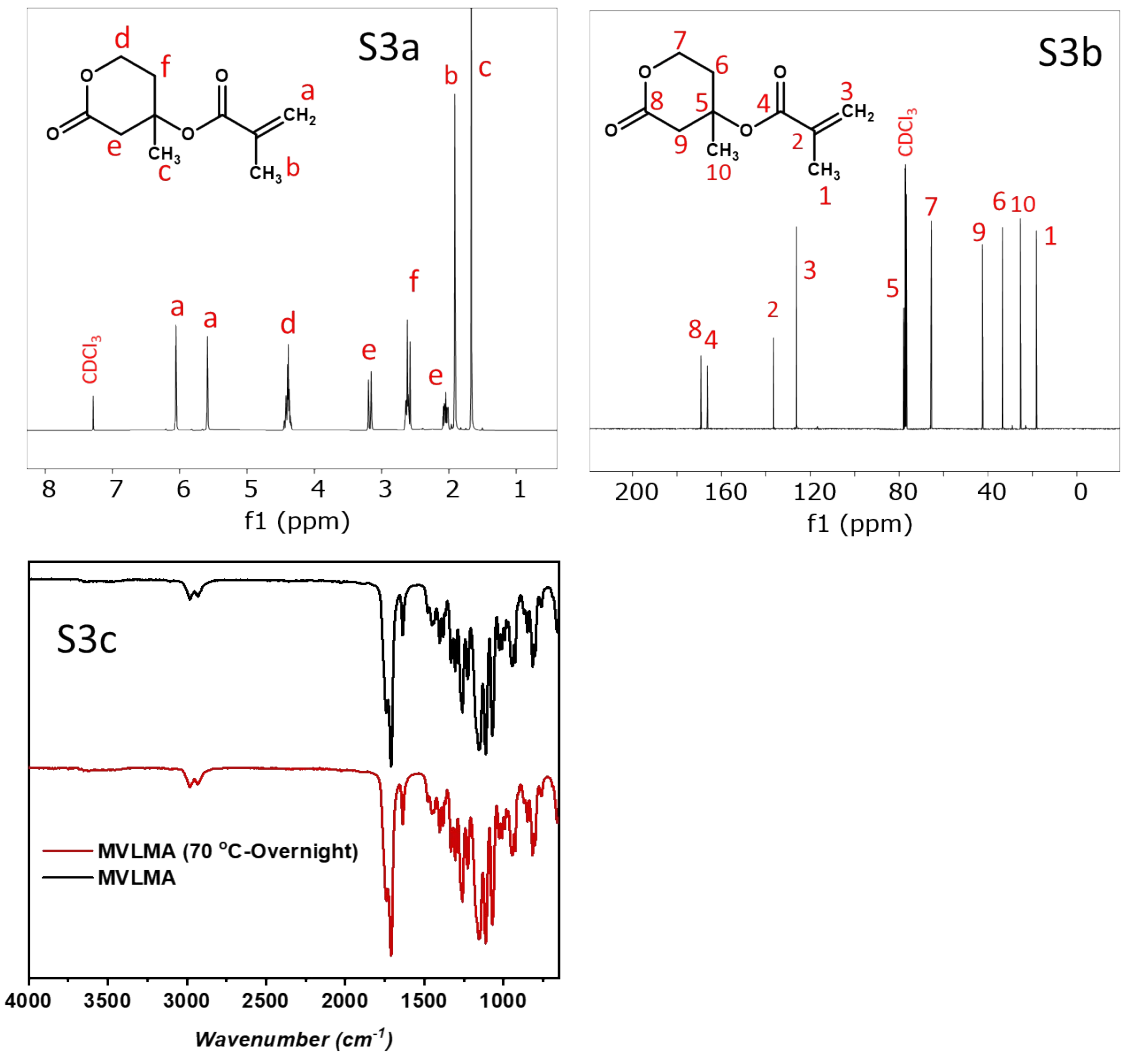



**Figure S3**. $^{1}H$ NMR (S3a) and $^{13}C$ NMR (S3b) results along with FT-IR spectrum (S3c) of MVLMA left in oven at 70 ºC overnight.

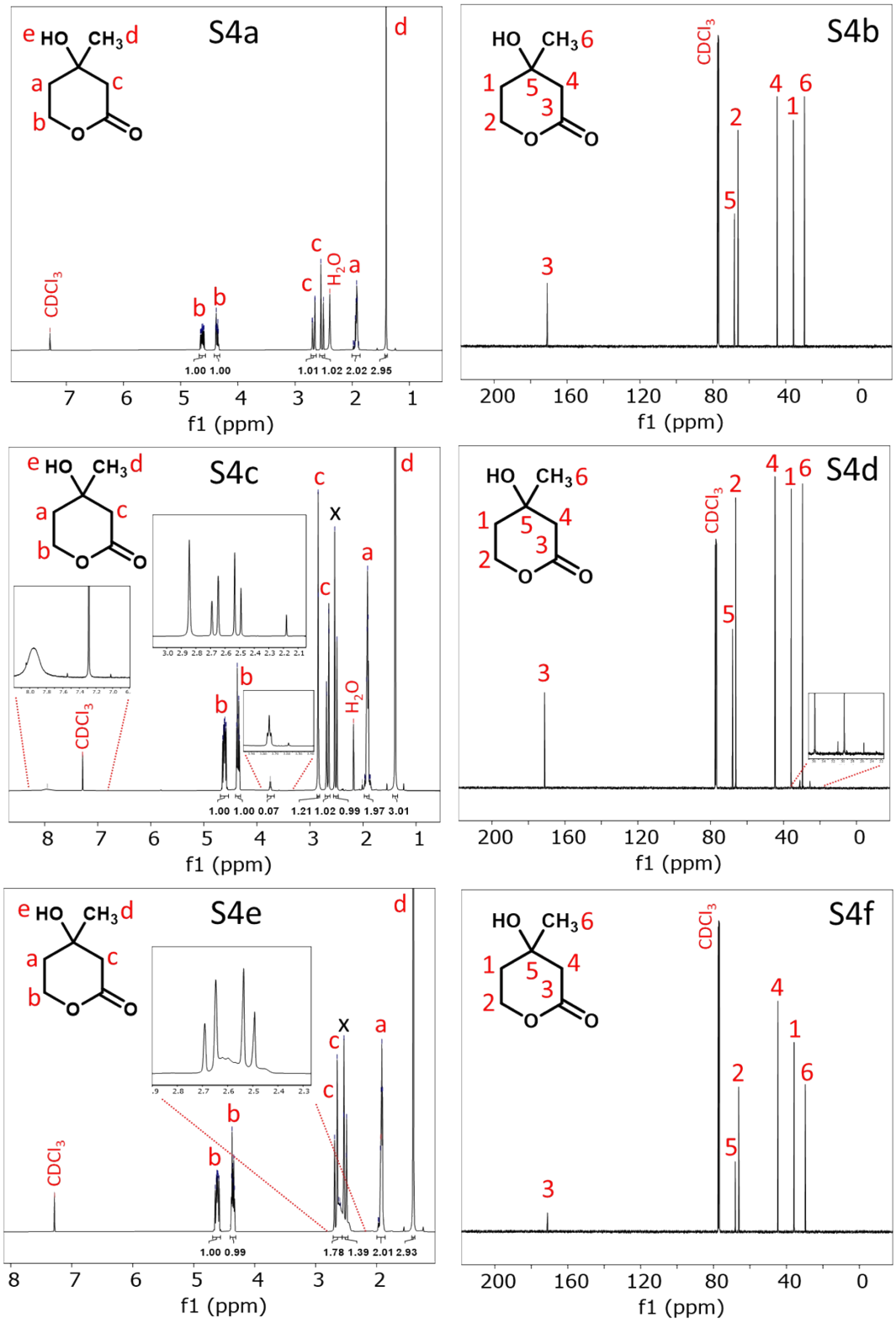



**Figure S4**. $^{1}$H NMR and $^{13}$C NMR results of pristine MVL (S4a,b), MVL exposed to UV light irradiation for 16 hours (S4c,d) and MVL placed in oven at 70 ºC overnight (S4e,f), respectively.

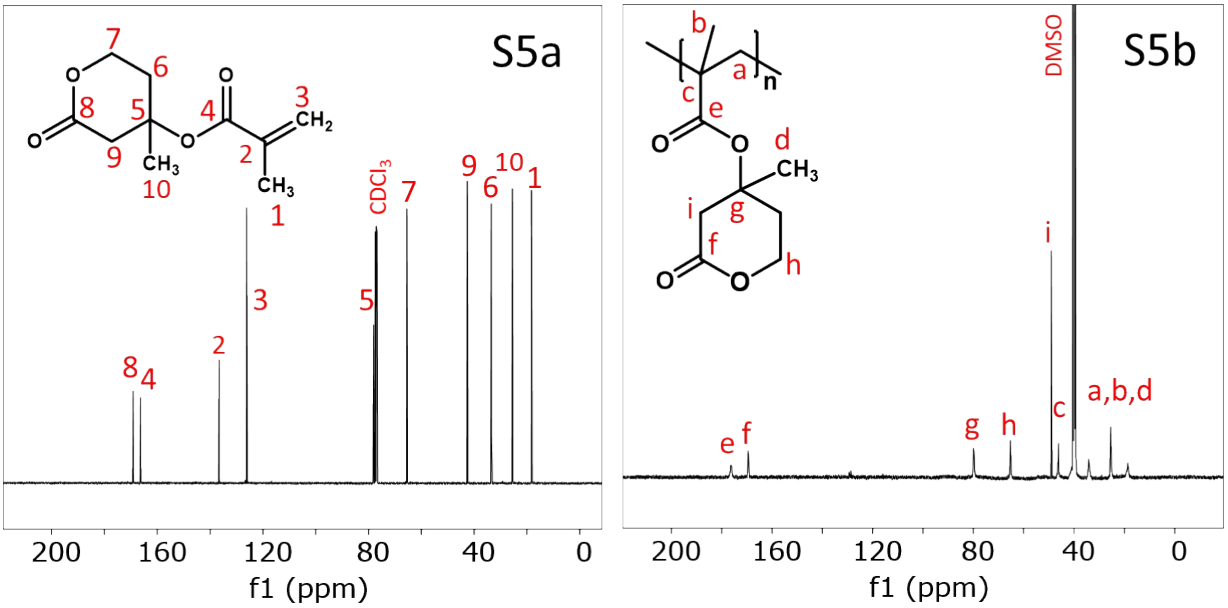



**Figure S5**. $^{13}C$ NMR results of MVLMA (S5a) and PMevL (S5b).

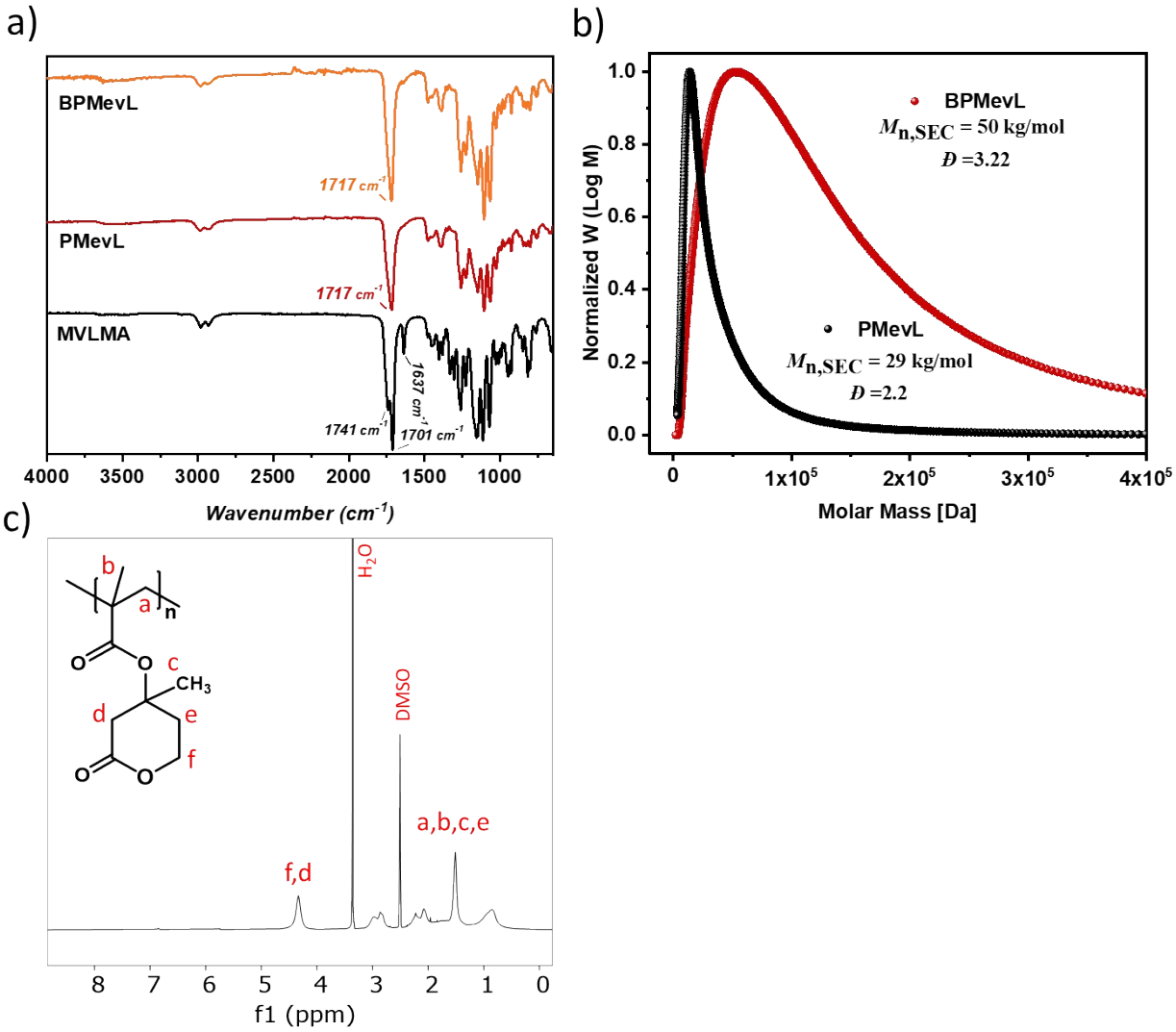



**Figure S6.** FT-IR spectrum (a), normalized SEC results expliciting molar mass distributions (b) and $^{1}$H NMR result (c) of BPMevL.

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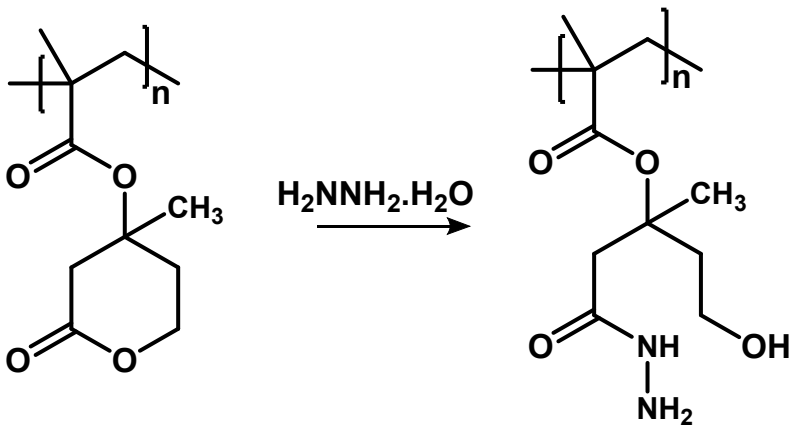


**Scheme S3.** Ring opening of mevalonic ring of PMevL via hydrazine monohydrate.

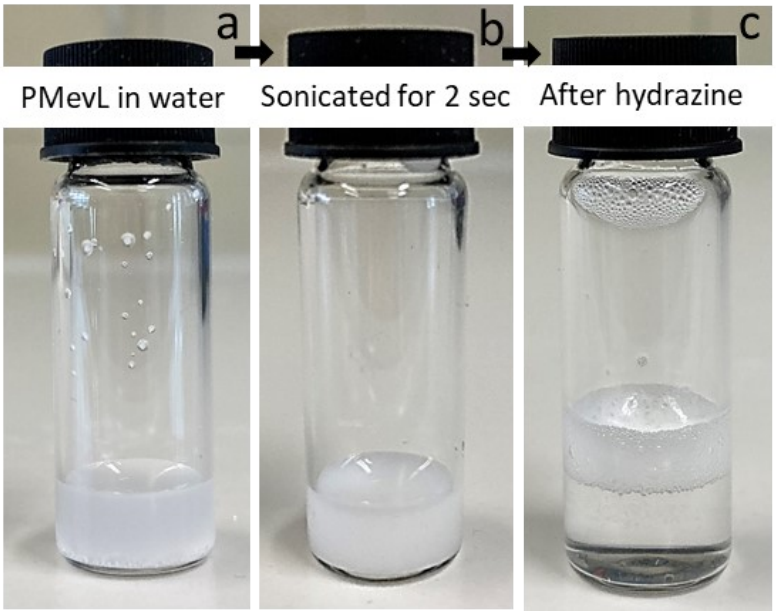


**Figure S7**. Digital images of aqueous PMevL (10 mg/500 µL) dispersion before (a) and after sonication (b) followed by hydrazine monohydrate (400 µL) addition (c) (transparency obtained in seconds).

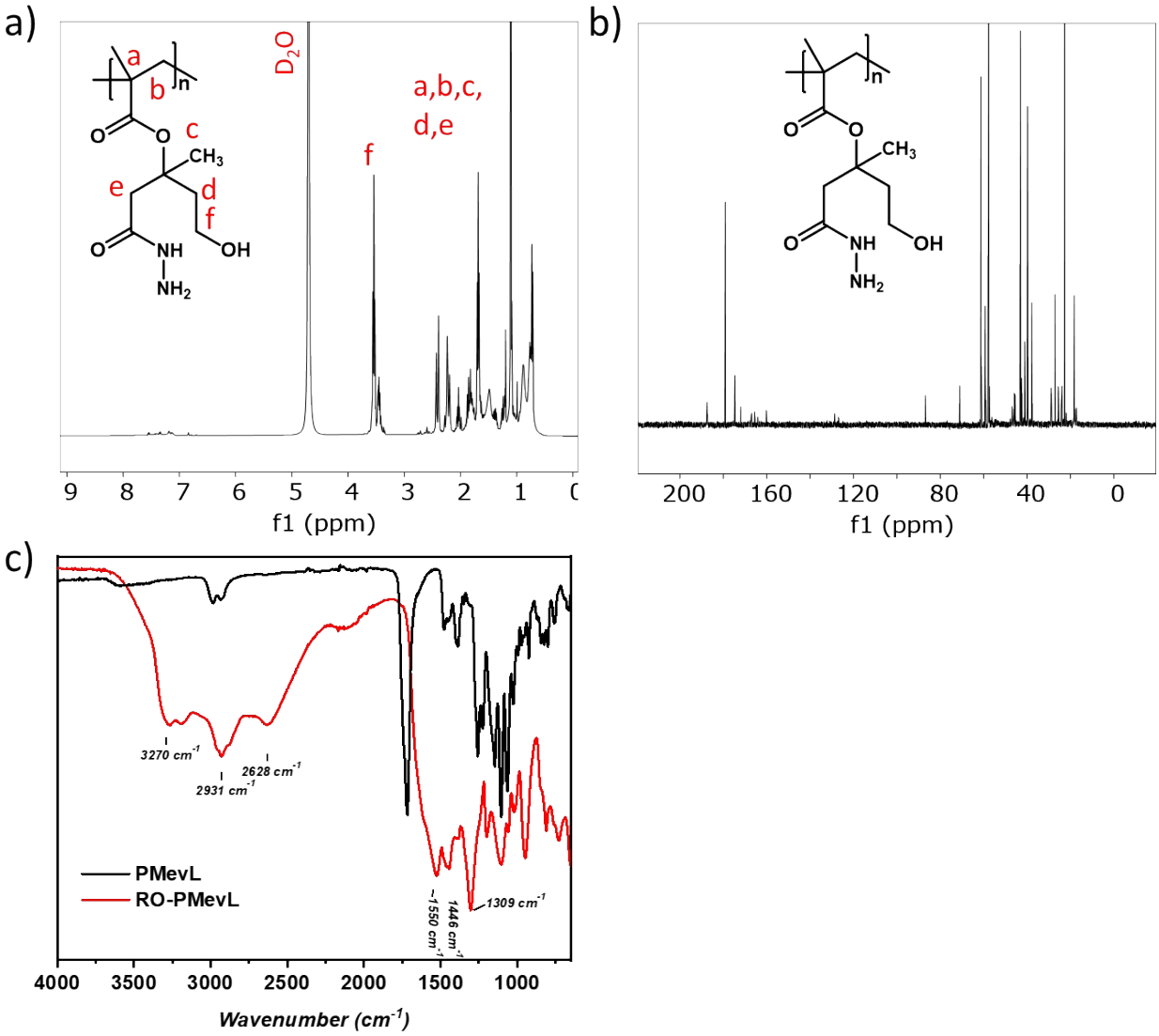


**Figure S8**. $^{1}$H NMR (a) and $^{13}$C NMR (b) results along with FT-IR spectrum (c) of RO-PMevL.

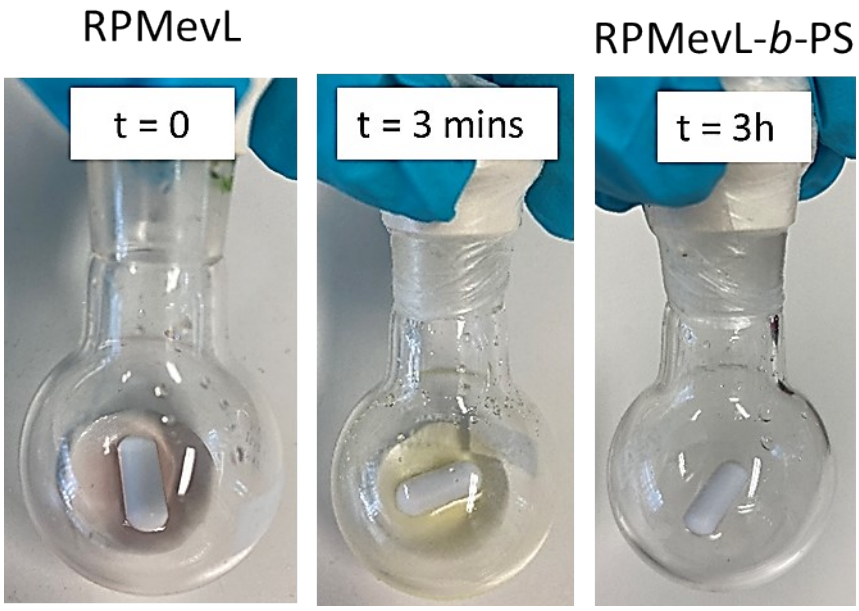


**Figure S9.** Digital images of RPMevL-*b*-PS reaction progress (colorimetric) at specified time intervals.

1. F. Tasaka, Y. Ohya and T. Ouchi, *Macromol. Rapid Commun.*, 2001, **22**, 820-824.
2. C. Zhang, D. K. Schneiderman, T. Cai, Y.-S. Tai, K. Fox and K. Zhang, *ACS Sustain. Chem. Eng.*, 2016, **4**, 4396-4402.
3. R. Dammel, M. Cook, A. Klauck-Jacobs, T. Kudo, S. Mehtsun, J. Oberlander, M. Padmanaban and D. L. Rahman, *J. Photopolym. Sci. Technol.*, 1999, **12**, 433-444.