

## Supporting Information

### **Improved thermal properties of polydimethylsiloxane by copolymerization and thiol-ene crosslinking of 2-pyrone-4,6-dicarboxylic acid moiety**

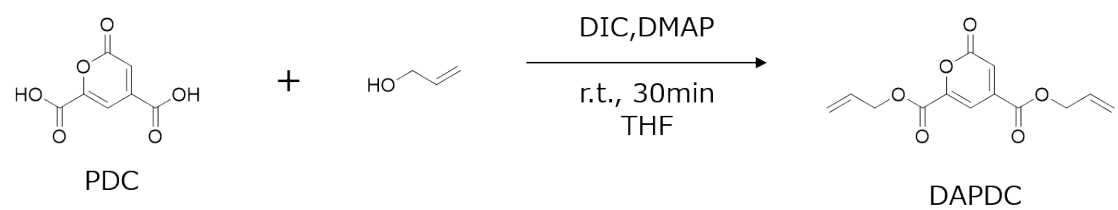
Takahiro Shimura,<sup>a,#</sup> Yijie Jin,<sup>a,#</sup> Keiichi Kuboyama,<sup>a</sup> Takuma Araki,<sup>b</sup> Naofumi Kamimura,<sup>c</sup> Eiji Masai,<sup>c</sup> Masaya Nakamura,<sup>c</sup> and Tsuyoshi Michinobu<sup>a,\*</sup>

<sup>a</sup> Department of Materials Science and Engineering, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8552, Japan. E-mail; michinobu.t.aa@m.titech.ac.jp

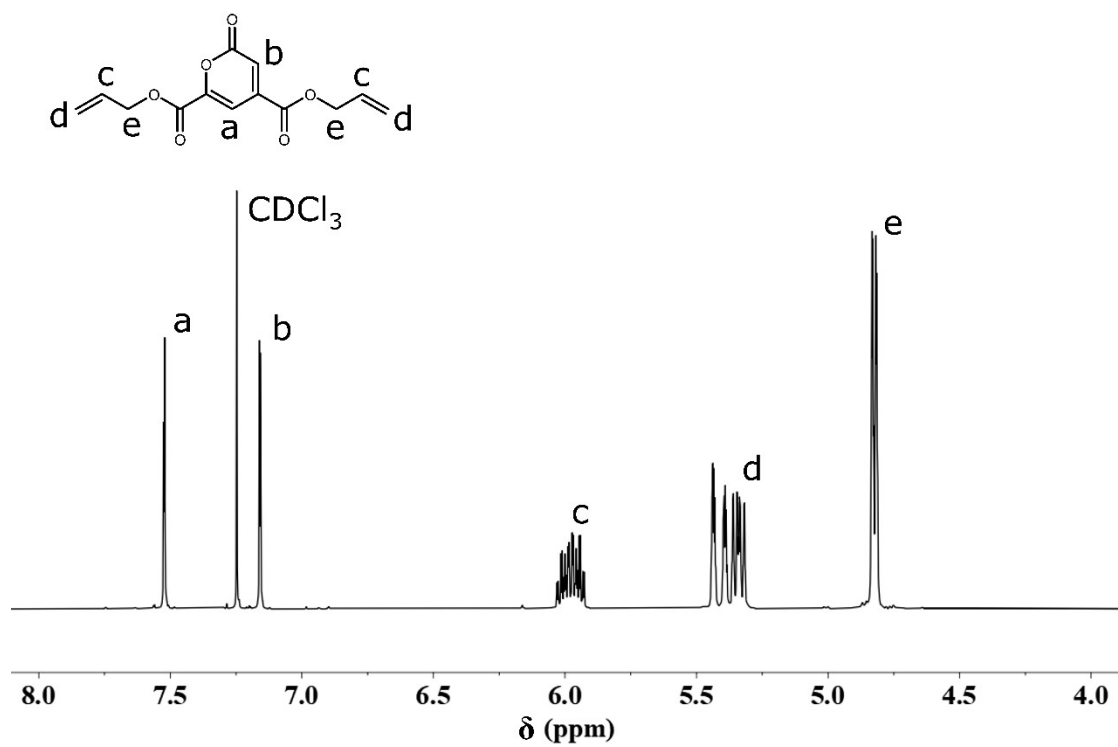
<sup>b</sup> Department of Forest Resource Chemistry, Forestry and Forest Products Research Institute, Tsukuba 305-8687, Japan.

<sup>c</sup> Department of Materials Science and Bioengineering, Nagaoka University of Technology, Nagaoka 940-2188, Japan.

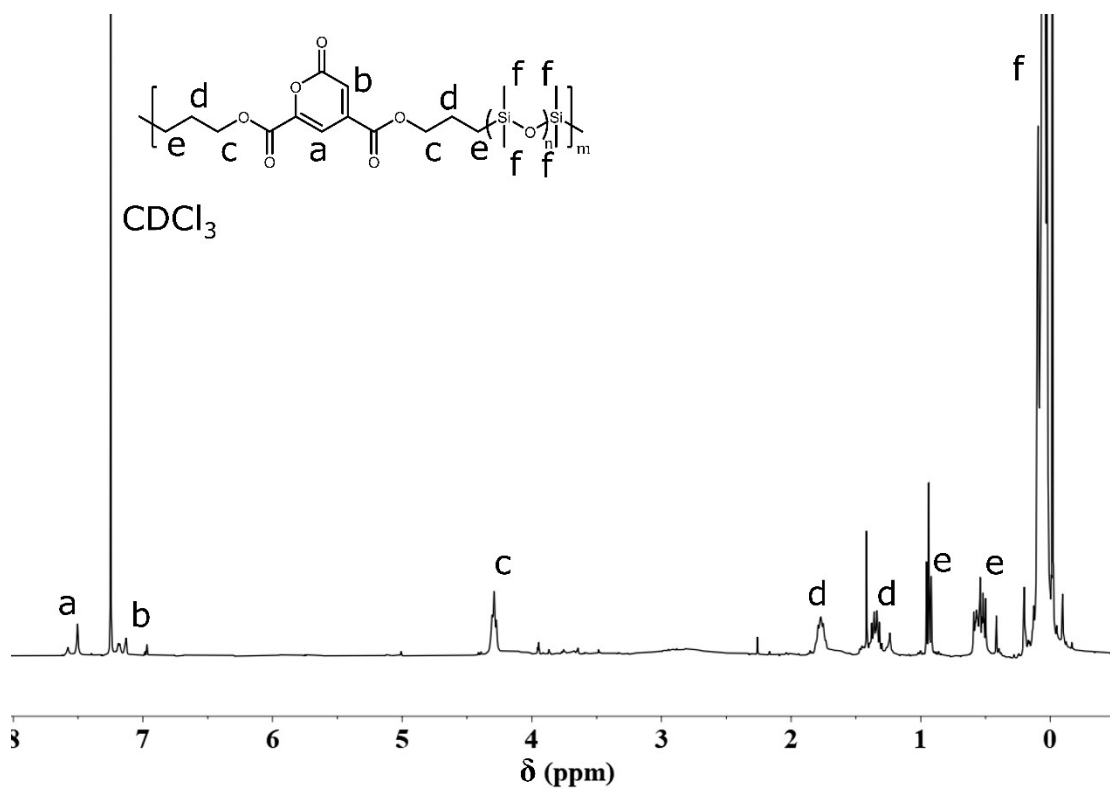
# These authors contributed equally.



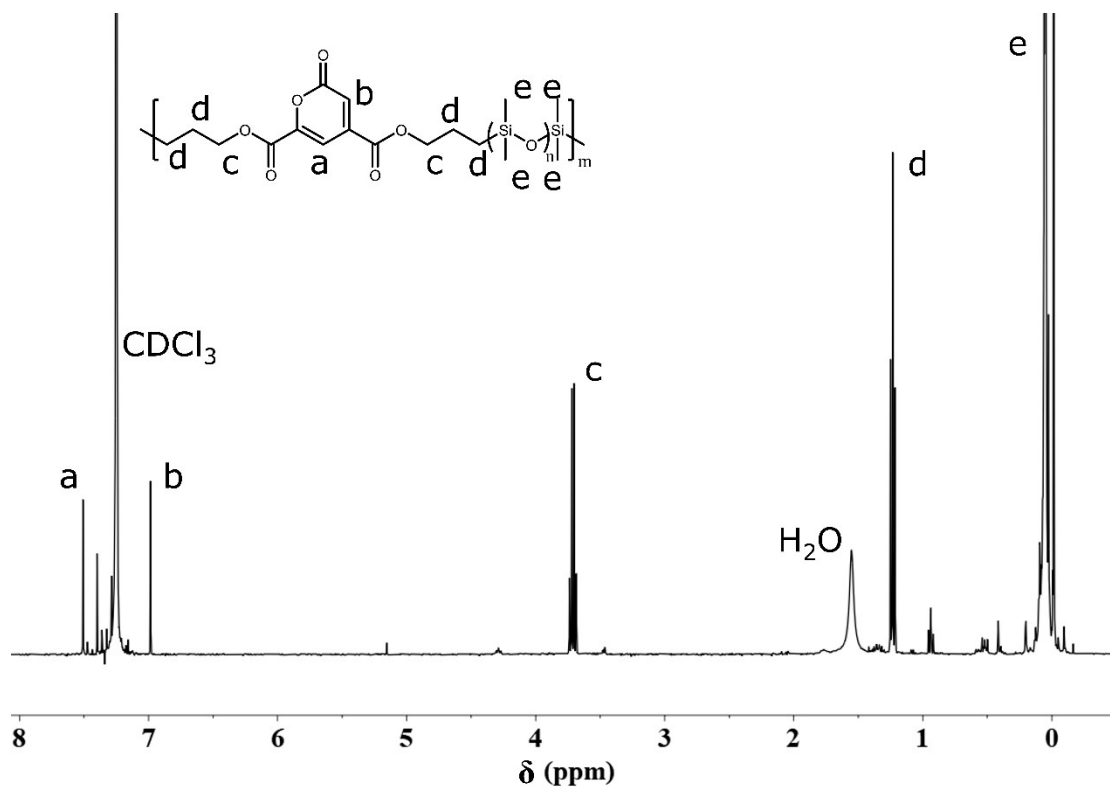
**Figure S1.** Synthesis of DAPDC.



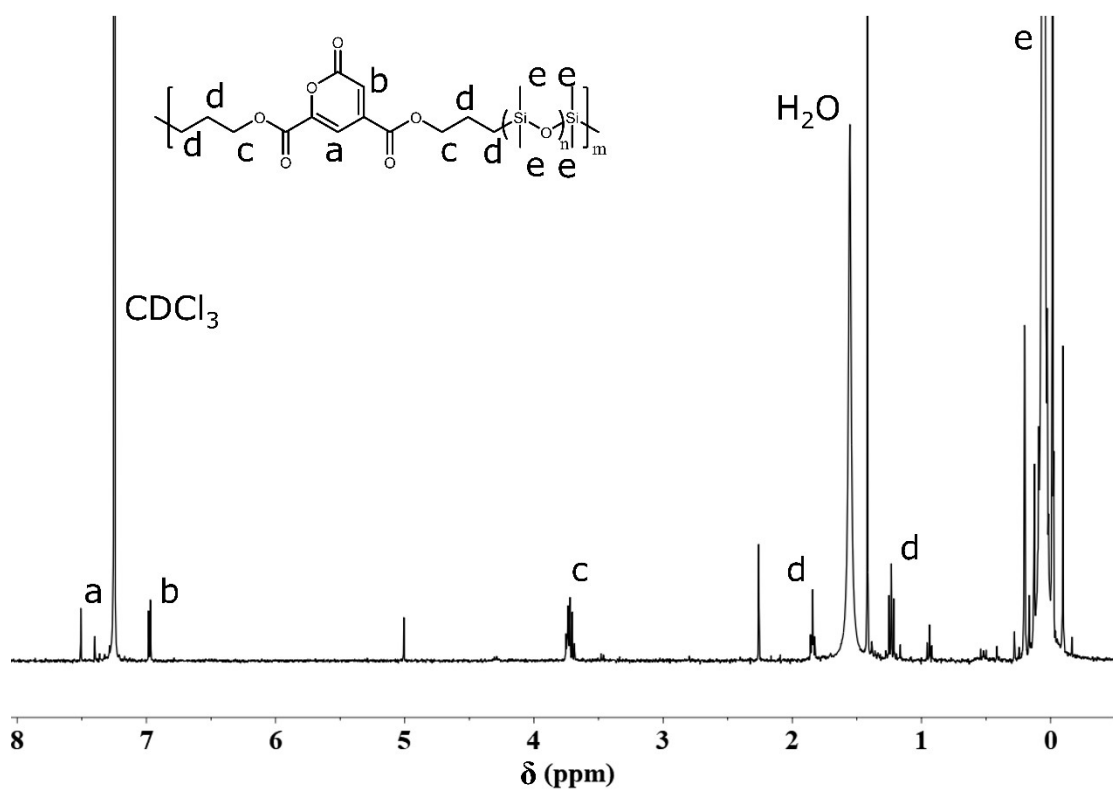
**Figure S2.**  $^1\text{H}$  NMR spectrum of DAPDC in  $\text{CDCl}_3$  at 20 °C.



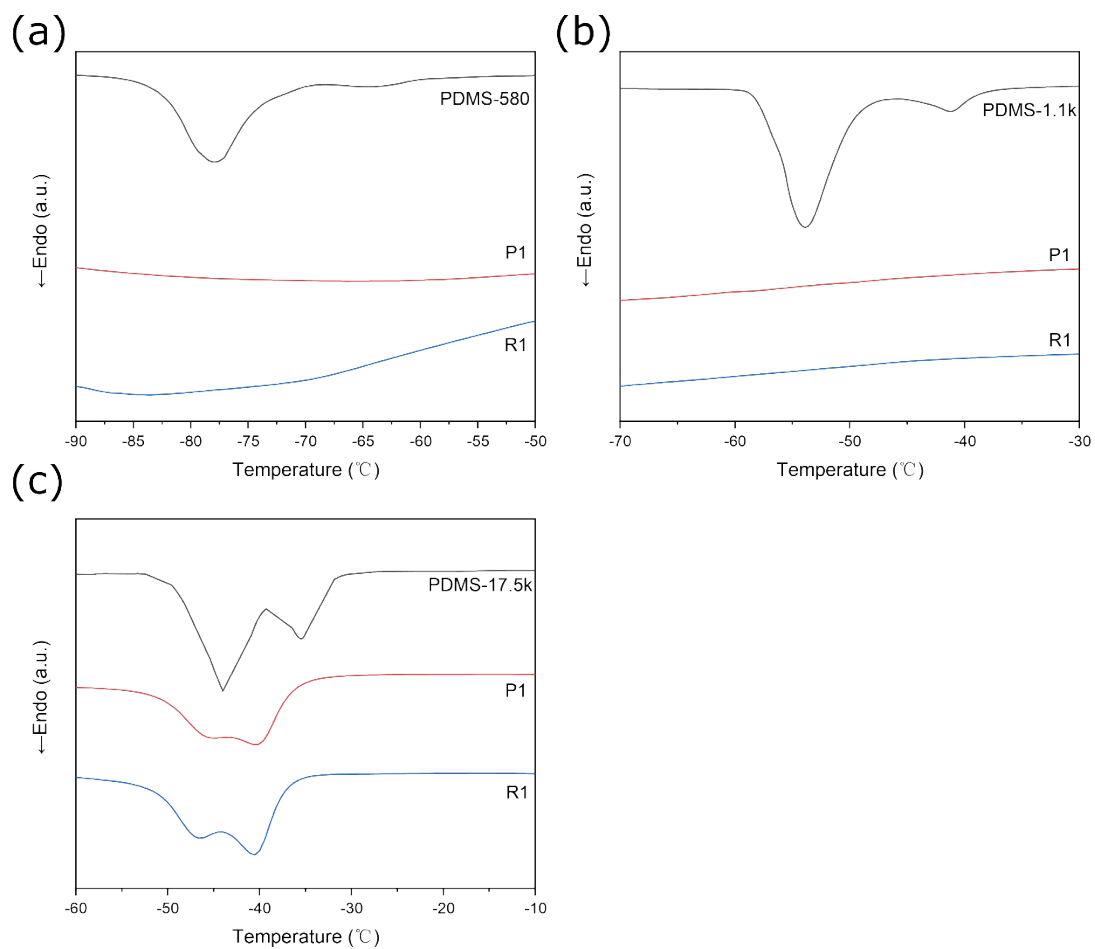
**Figure S3.** <sup>1</sup>H NMR spectrum of P1 in CDCl<sub>3</sub> at 20 °C.



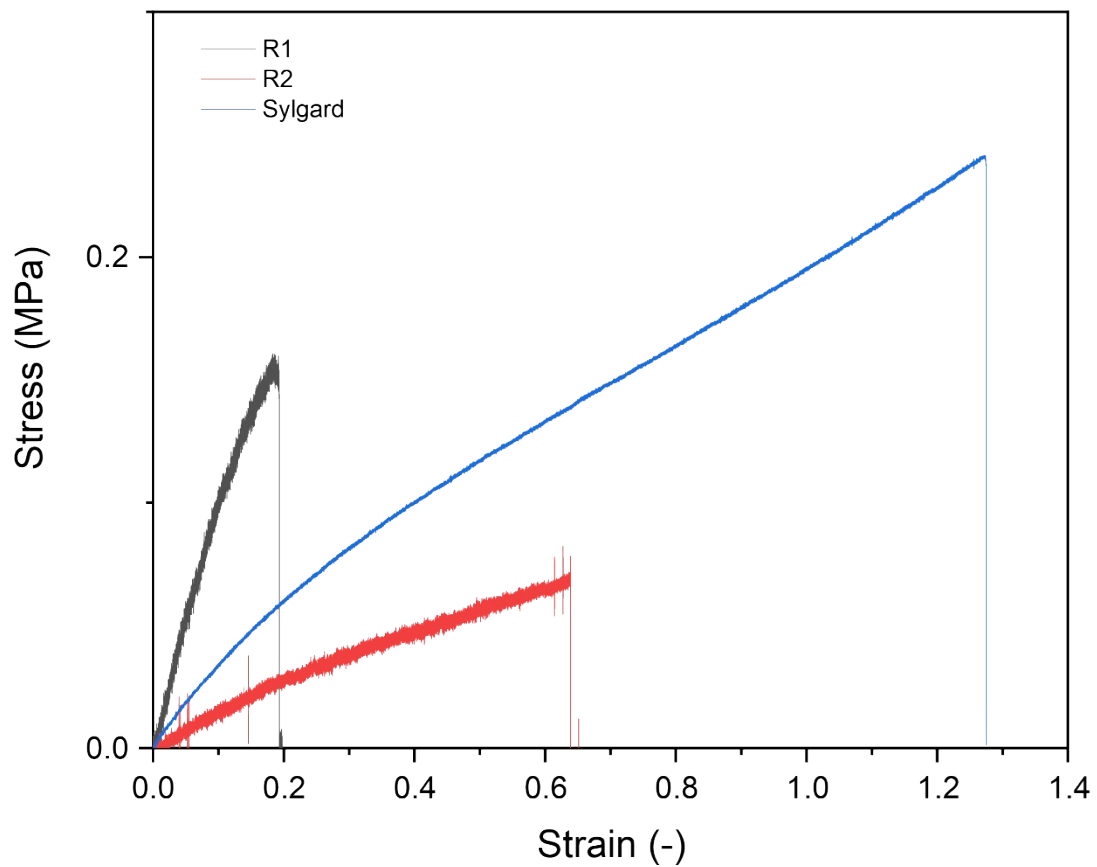
**Figure S4.** <sup>1</sup>H NMR spectrum of P2 in CDCl<sub>3</sub> at 20 °C.



**Figure S5.** <sup>1</sup>H NMR spectrum of **P3** in CDCl<sub>3</sub> at 20 °C.



**Figure S6.** DSC curves (2<sup>nd</sup> heating scan) of (a) PDMS-580, **P1**, and **R1**; (b) PDMS-1.1k, **P2**, and **R2**; (c) PDMS-17.5k, **P3**, and **R3** at the heating rate of 10 °C min<sup>-1</sup> under flowing nitrogen.



**Figure S7.** Tensile stress-strain curve of **R1**, **R2**, and Sylgard.