Bespoke Polyamides via Post-Polymerization Modification Using Accessible Bioadvantaged Monounsaturated Long Chain Fatty Acids Units

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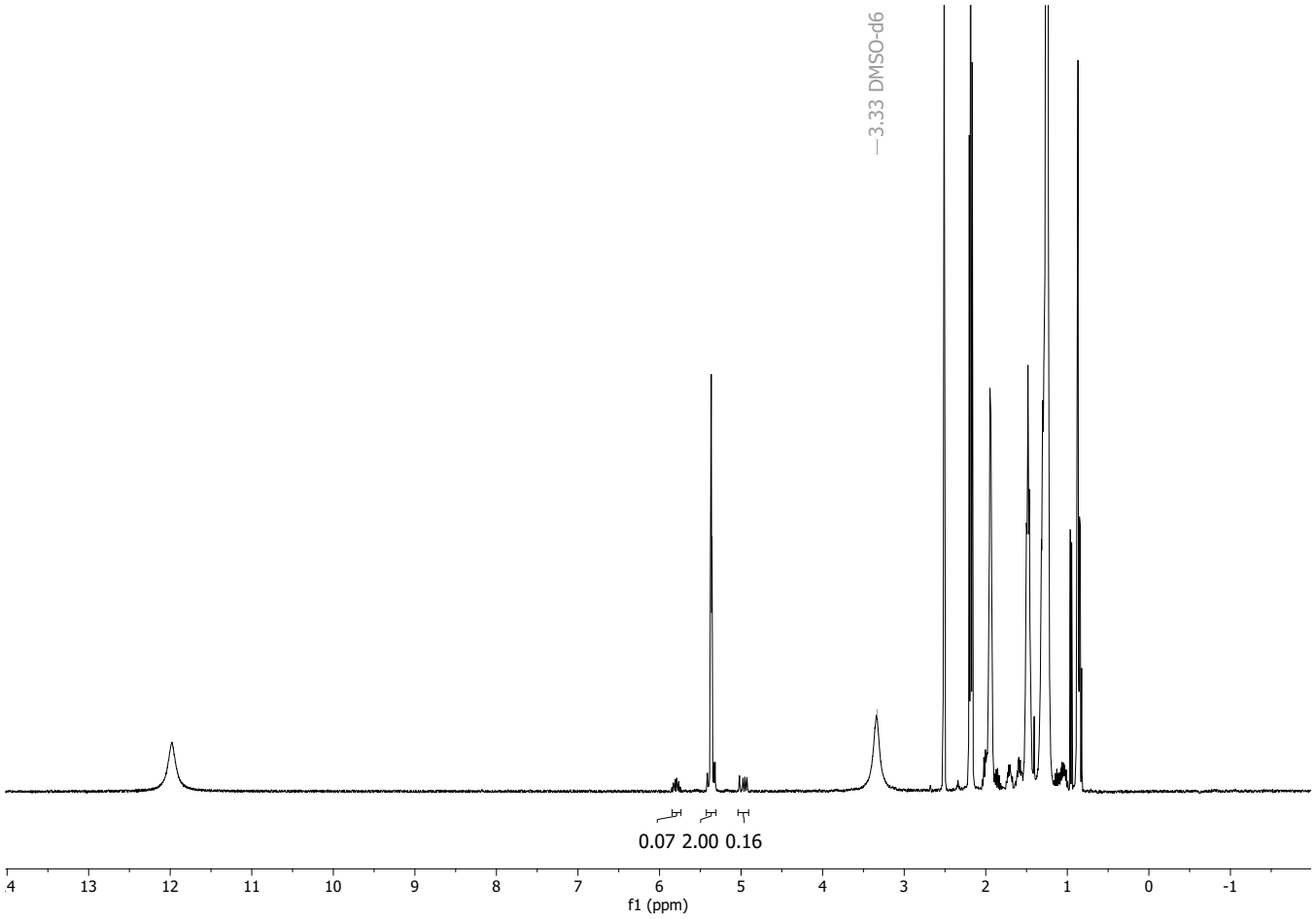

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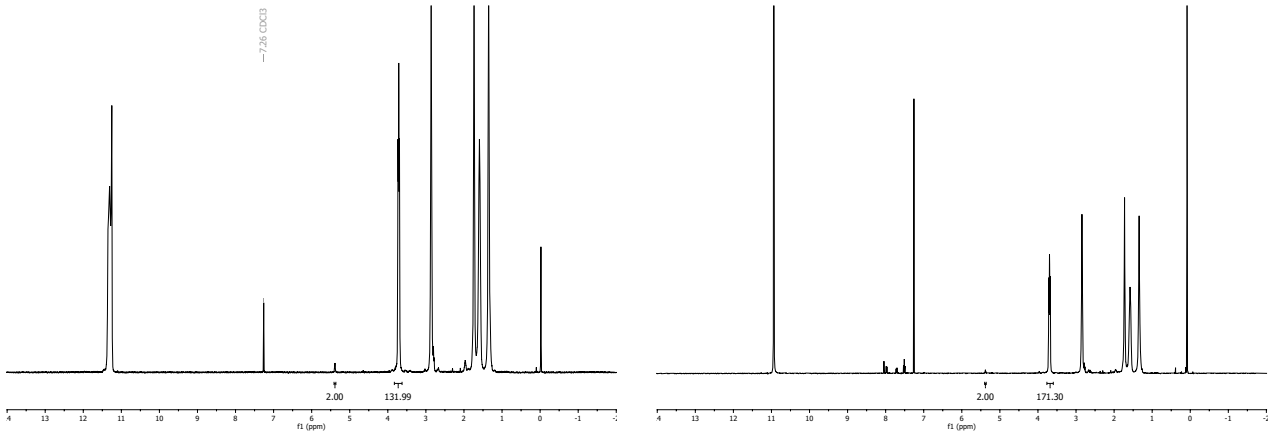

(a) (b)

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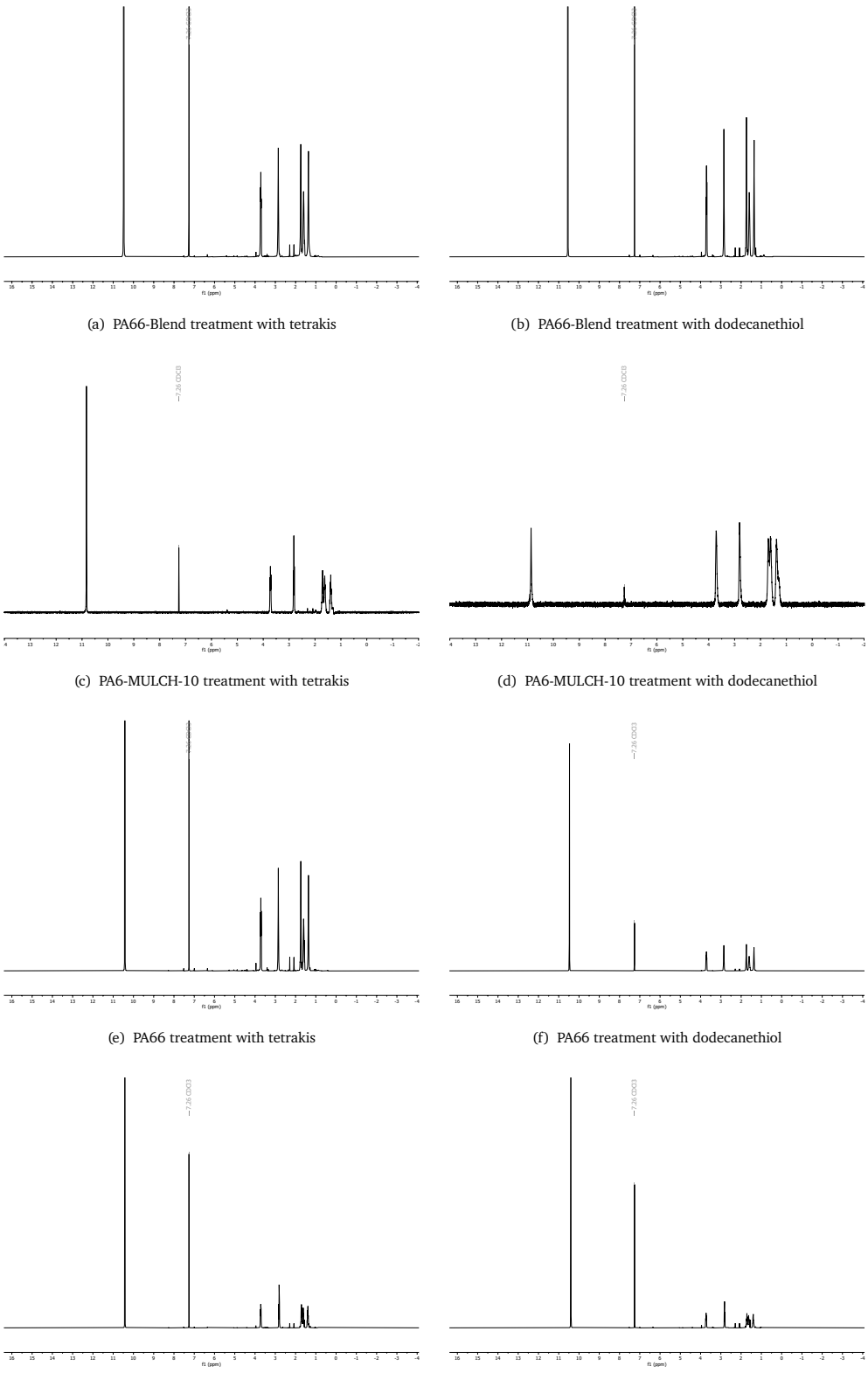

(a) PA66-Blend treatment with tetrakis

(b) PA66-Blend treatment with dodecanethiol

(c) PA6-MULCH-10 treatment with tetrakis

(d) PA6-MULCH-10 treatment with dodecanethiol

(e) PA66 treatment with tetrakis

(f) PA66 treatment with dodecanethiol

(g) PA6 treatment with tetrakis

(h) PA6 treatment with dodecanethiol

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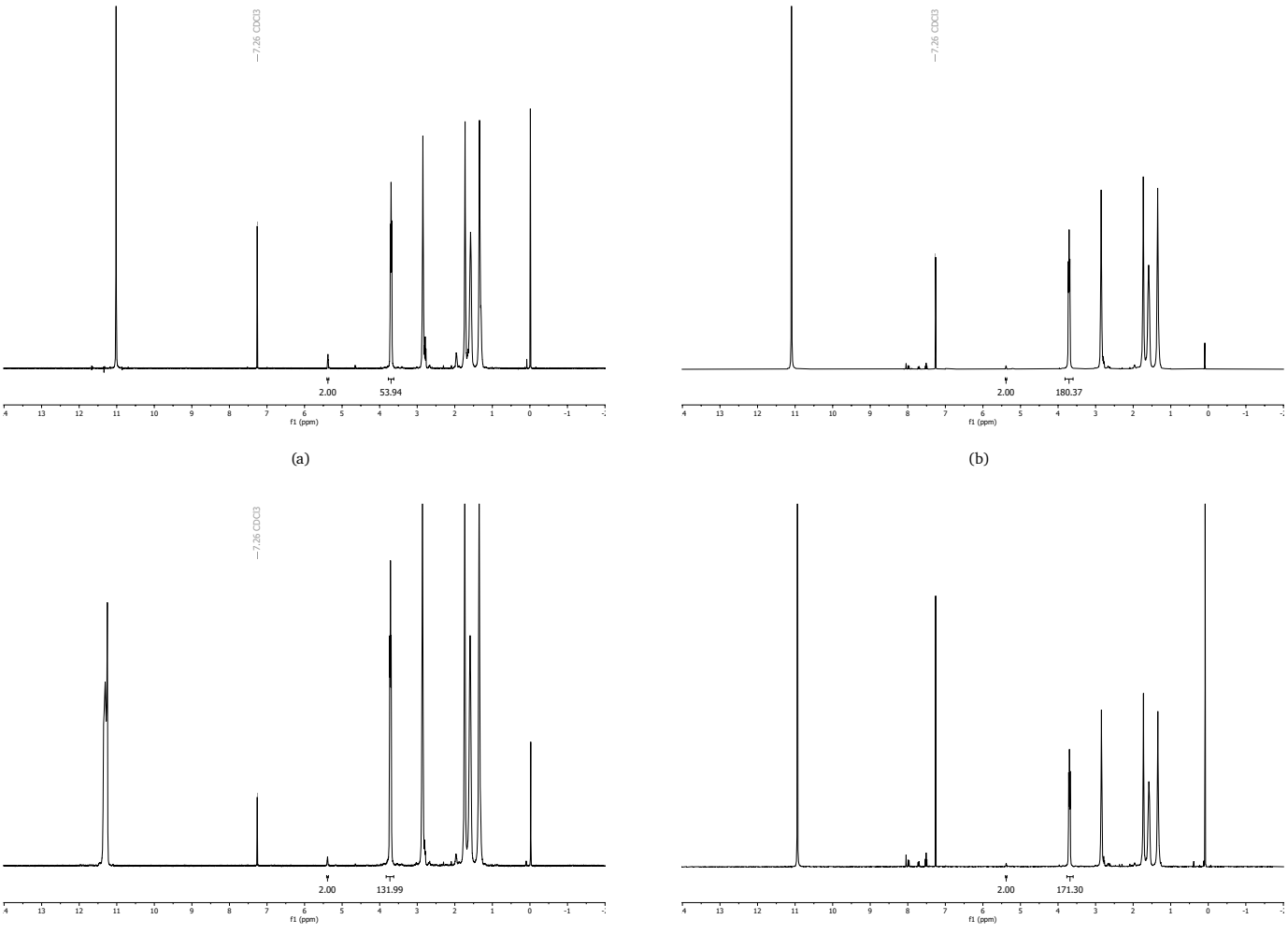


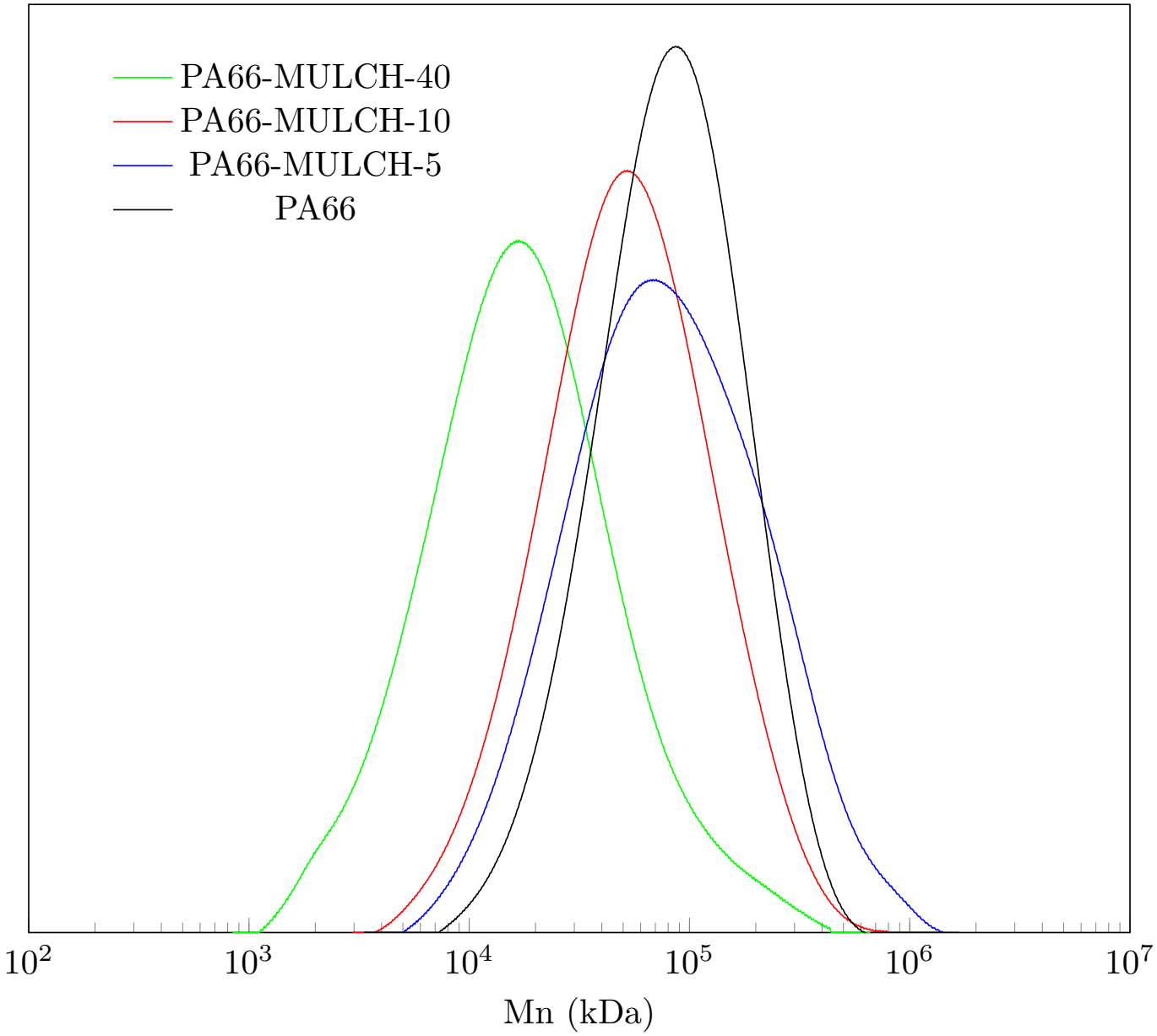
(a)

(b)

(c) PA66-MULCH-5 after thermal processing into dogbones

(d)

Fig. S4 The full spectra for the epoxidation of the MULCH polyamide, varied by concentration of MULCH addition. The decrease of the alkene between the original and its subsequent reaction shows the reactivity of the alkene in solid-state reactions.



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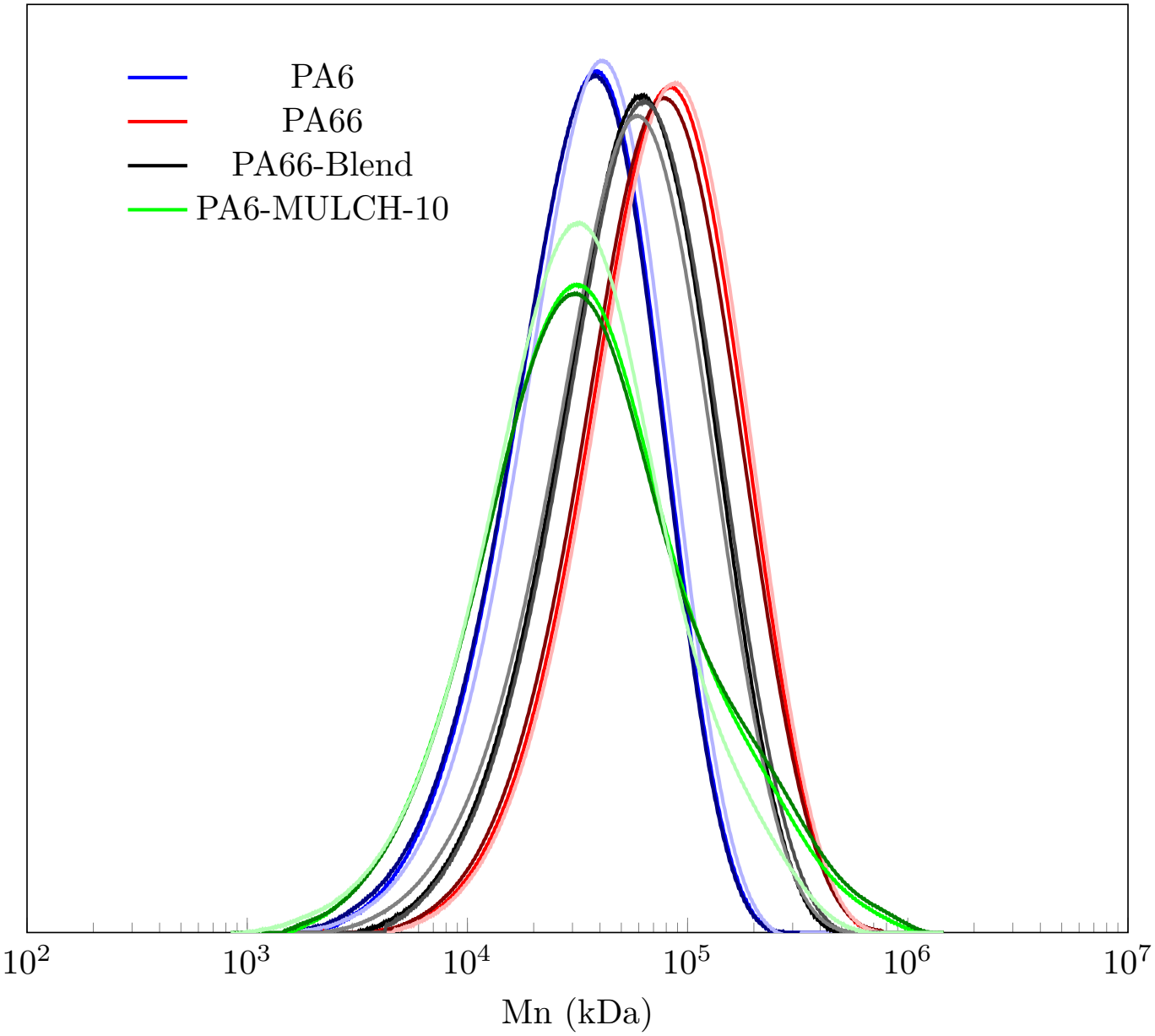

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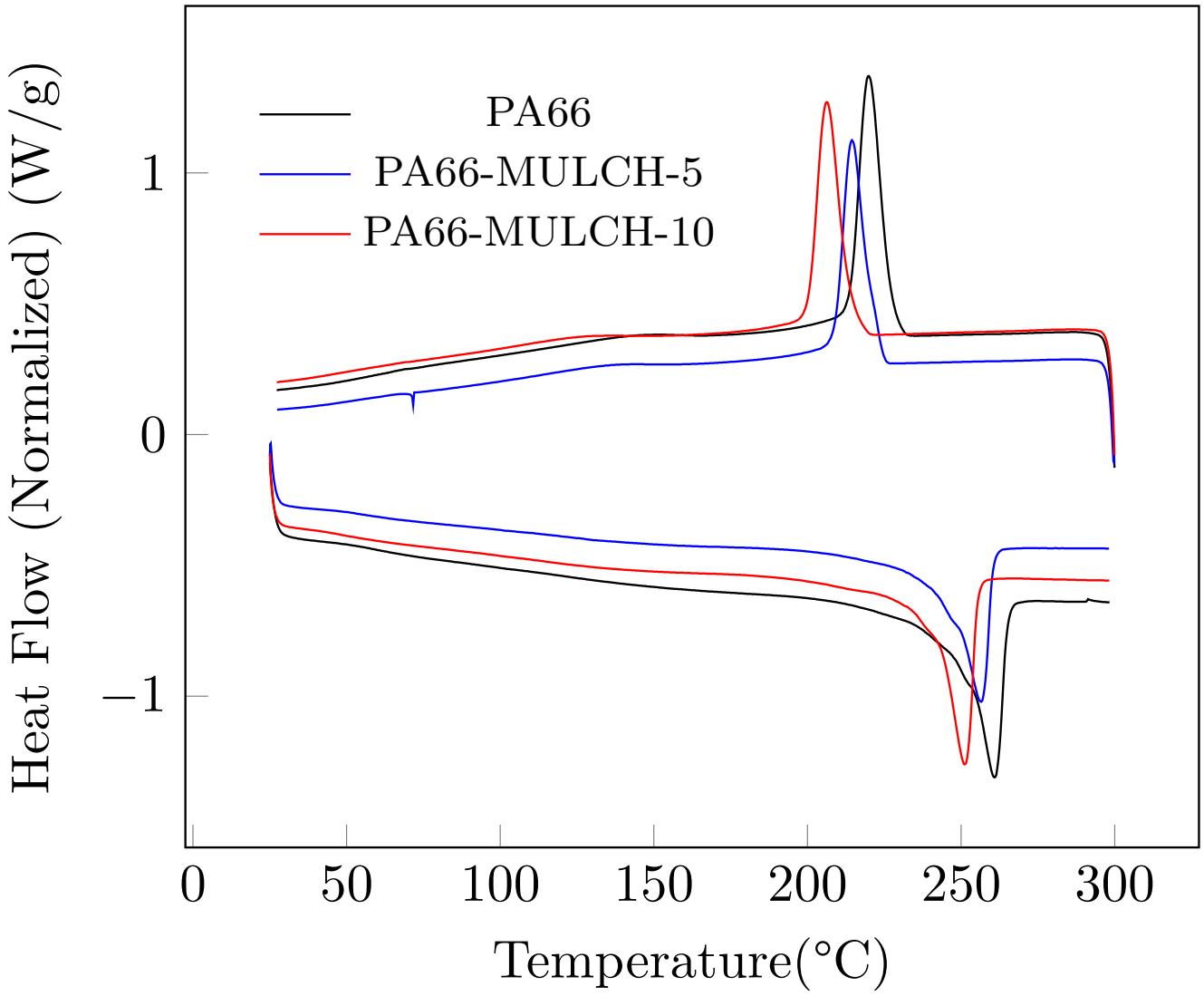


Fig. S8 DSC of pure PA66, PA66-MULCH-5, and PA66-MULCH-10.

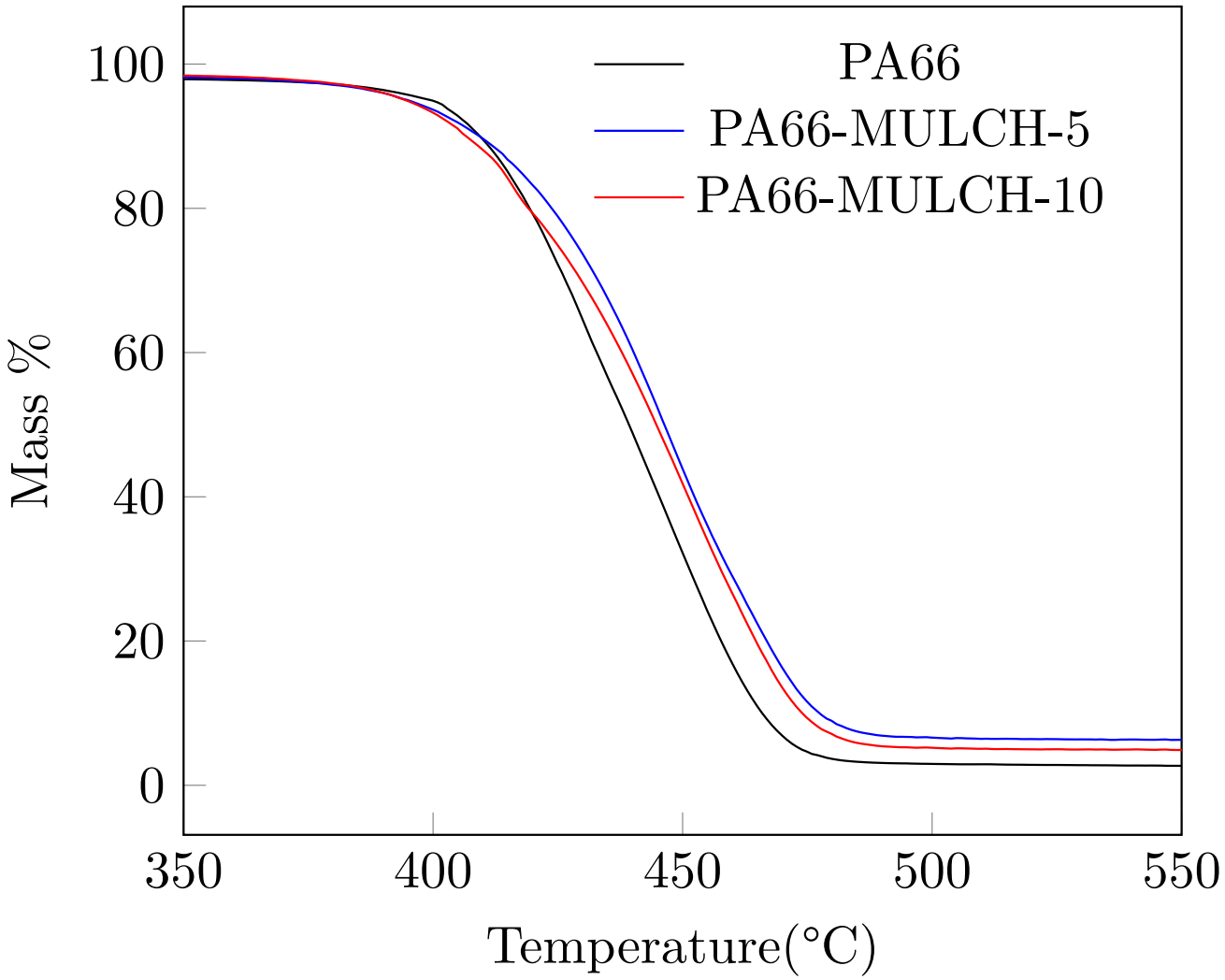
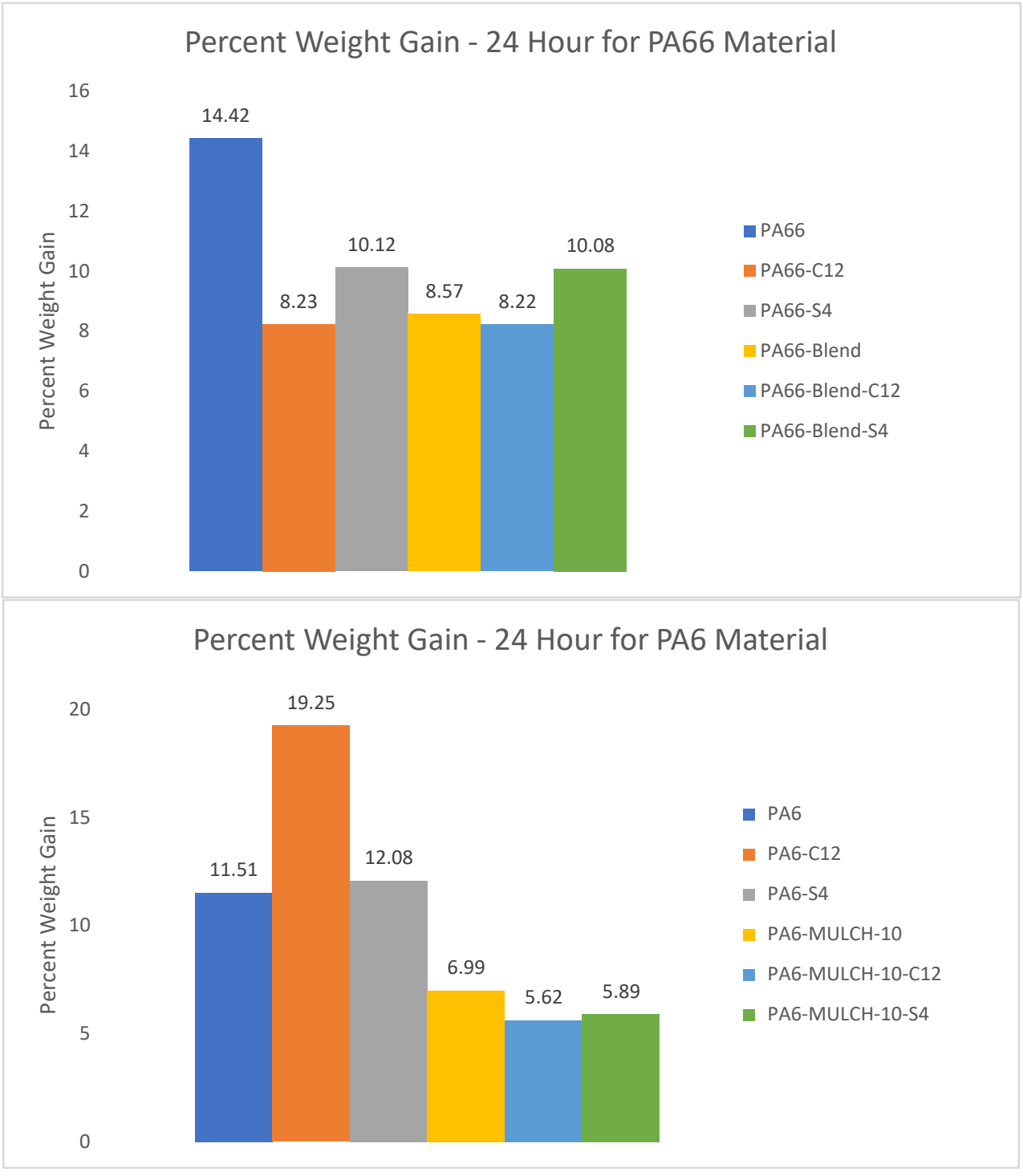


Fig. S9 TGA of pure PA66, PA66-MULCH-5, and PA66-MULCH-10



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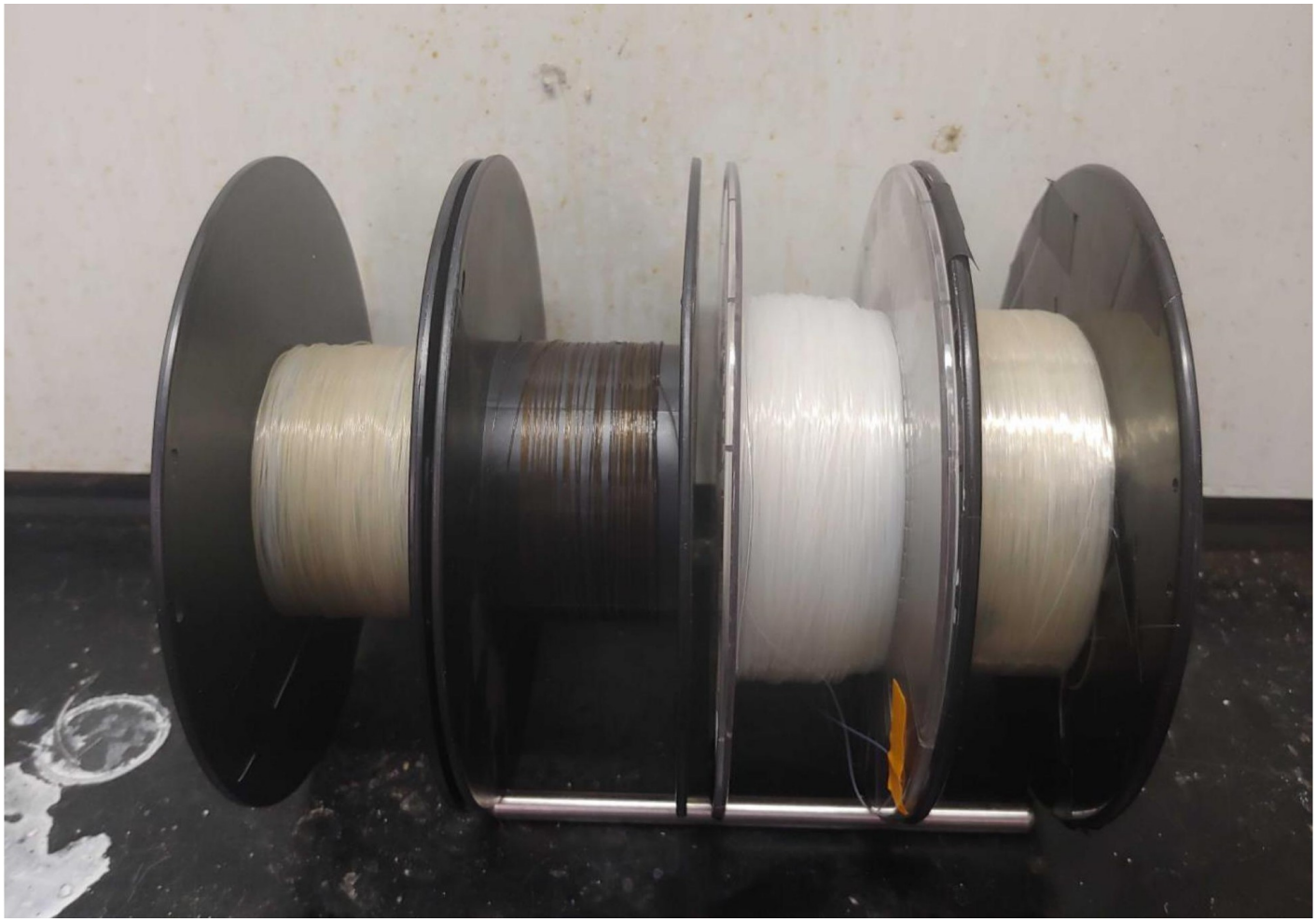

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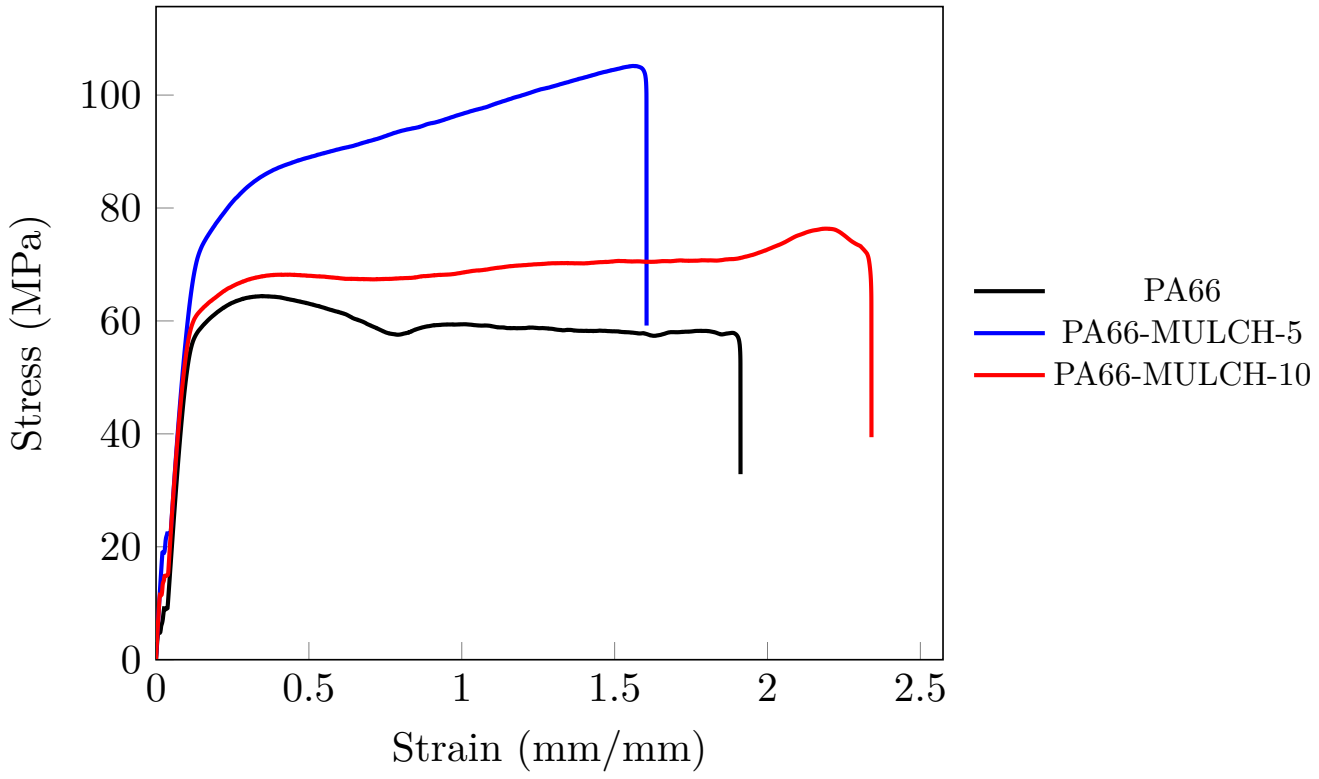

Fig. S12 Tensile test of pure PA66 and PA66-MULCH-5 and PA66-MULCH-10

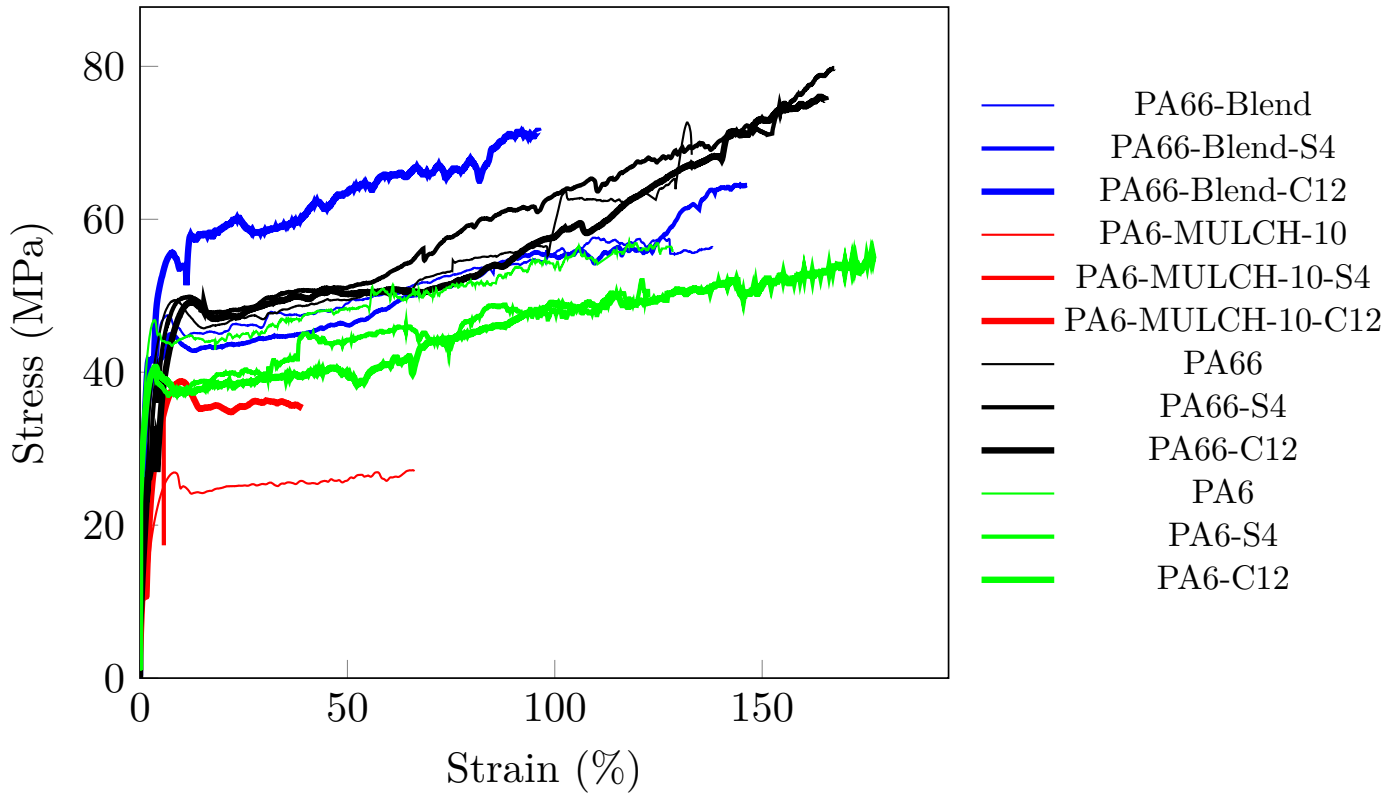

Fig. S13 Tensile test of four kinds of fiber; industrial PA6 and PA66, PA66-Blend, and PA6-MULCH-10. Each fiber was modified with either dodecanthiol or tetrakis. They were bundled into batches of 5 fibers then tested on a universal testing machine.

(a) ANOVA Results for neat dogbones

Property	**F-statistic**	**p-value**
UTS	6.270	0.033890
Elongation at yield	0.200	0.823644
Elongation at break	0.120	0.888825

(b) ANOVA Results for fibers

Property	**F-statistic**	**p-value**
UTS	37.005	0.000049
Elongation at yield	12.365	0.002258
Elongation at break	11.847	0.002590

Fig. S14 Statistical analysis using ANOVA test for mechanical data. Table (a) includes the values for the neat dogbones (PA66, PA66-MULCH-5, and PA66-MULCH-10) while (b) includes values for fibers (PA6, PA66, PA6-MULCH-10, PA66-Blend-10).