Supporting information

# High-temperature solvent-free synthesis of low-molecular-weight organogelators consisting of starch-derived 1,5-anhydro-D-glucitol coupled with fatty acids

Shiro Komba* and Rika Iwaura

Food Research Institute, National Agriculture and Food Research Organization,
2-1-12, Kannondai, Tsukuba, Ibaraki 305-8642, Japan.

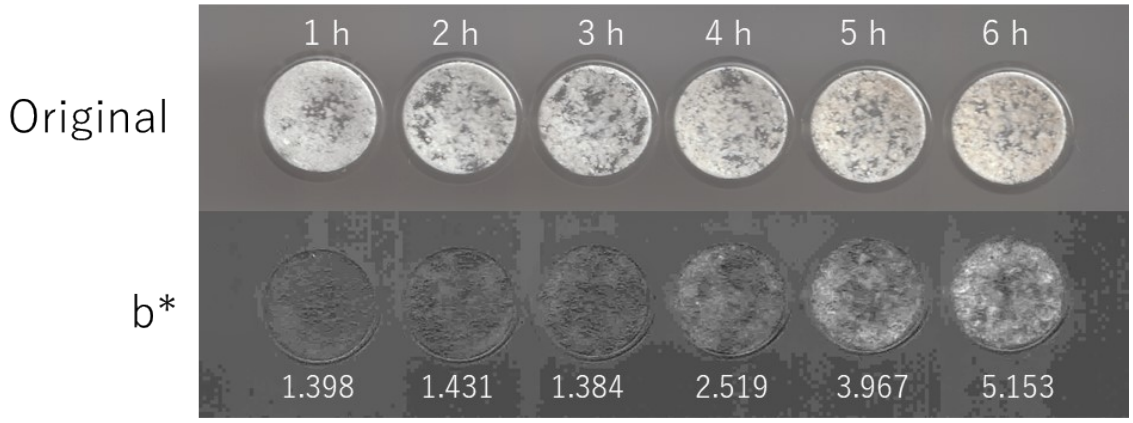


**Fig. 1s** Scan image and converted b* stack image for measuring yellowness (whiteness) shown in (C) of Fig. 2.

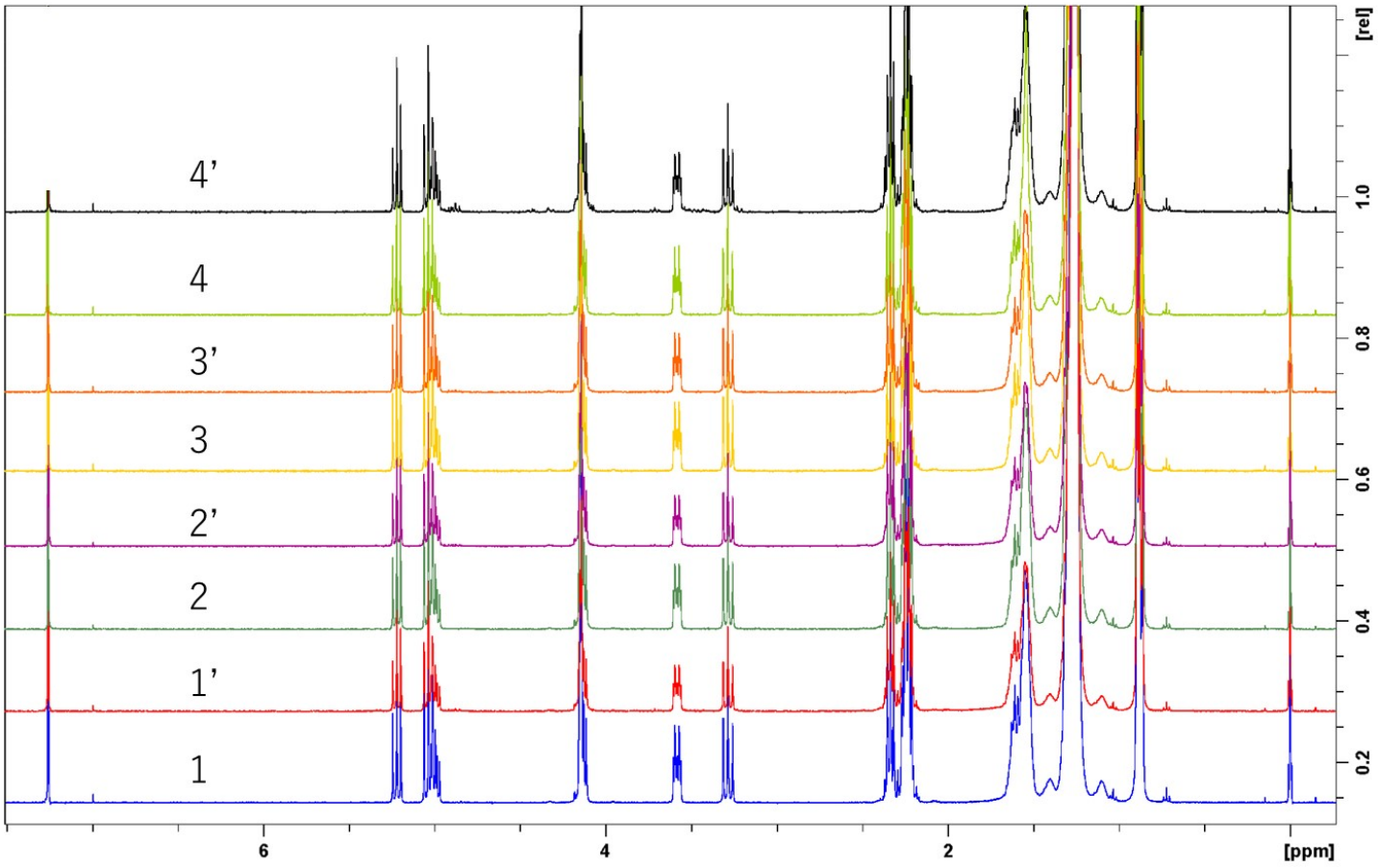


**Fig. 2s** $^{1}$H-NMR spectra of each sample of C16AG in $CDCl_3$ ($Me_4Si$ = 0 ppm). 1: $K_2CO_3$, primary crystal (Table 1, entry 1), 1': $K_2CO_3$, secondary crystal (Table 1, entry 1'), 2: NaOH, primary crystal (Table 1, entry 2), 2': NaOH, secondary crystal (Table 1, entry 2'), 3: KOH, primary crystal (Table 1, entry 3), 3': KOH, secondary crystal (Table 1, entry 3'), 4: noncatalyst, primary crystal (Table 1, entry 4), 4': noncatalyst, secondary crystal (Table 1, entry 4').

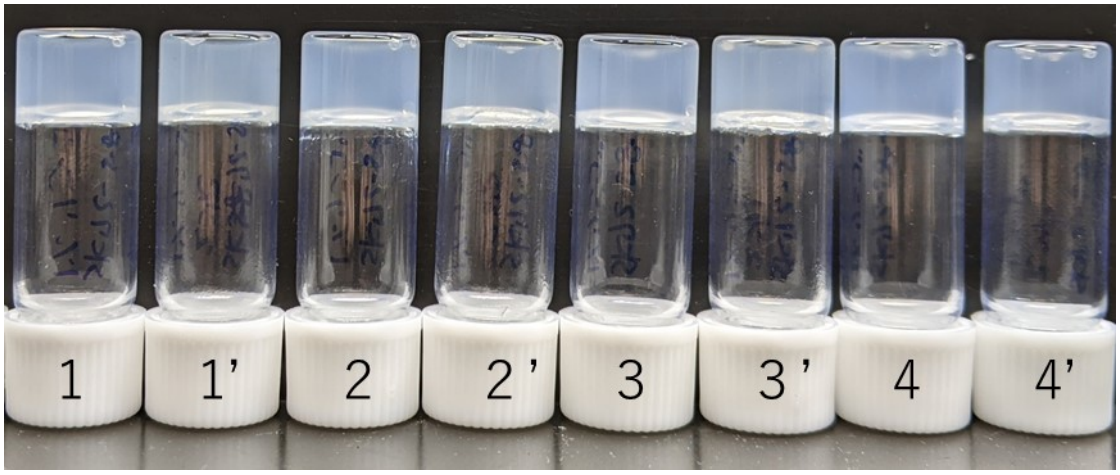


**Fig. 3s** Appearance of gels (1 wt % gel of each sample in diisostearyl malate) in each entry shown in Table 1. None of the gels flowed down when inverted.

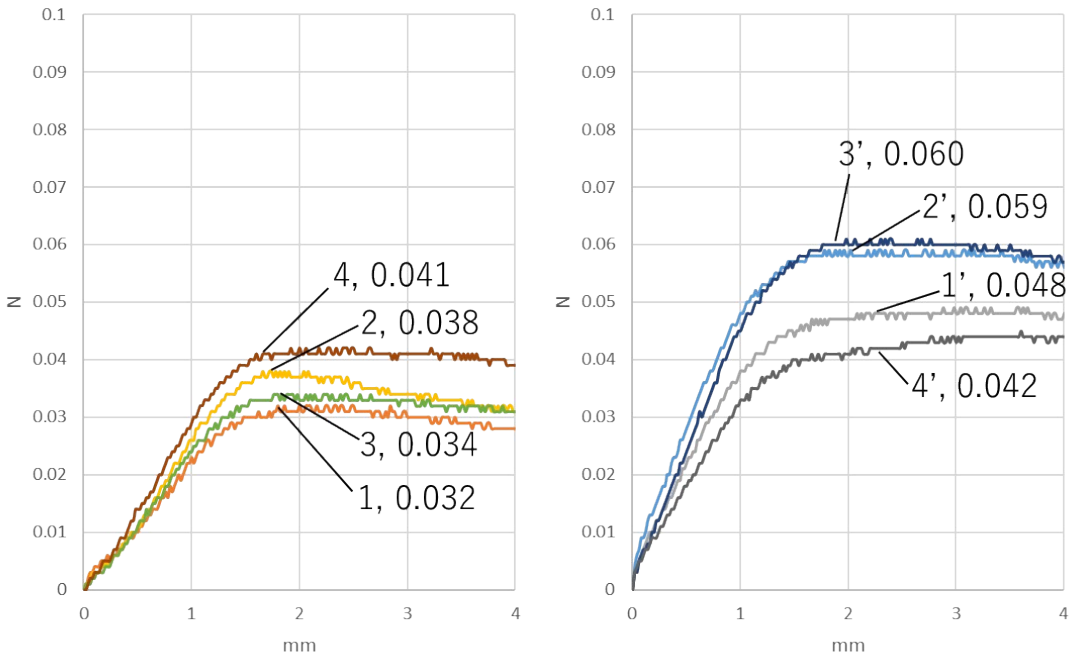


**Fig. 4s** Gel hardness measurement results for each entry are shown in Table 1.

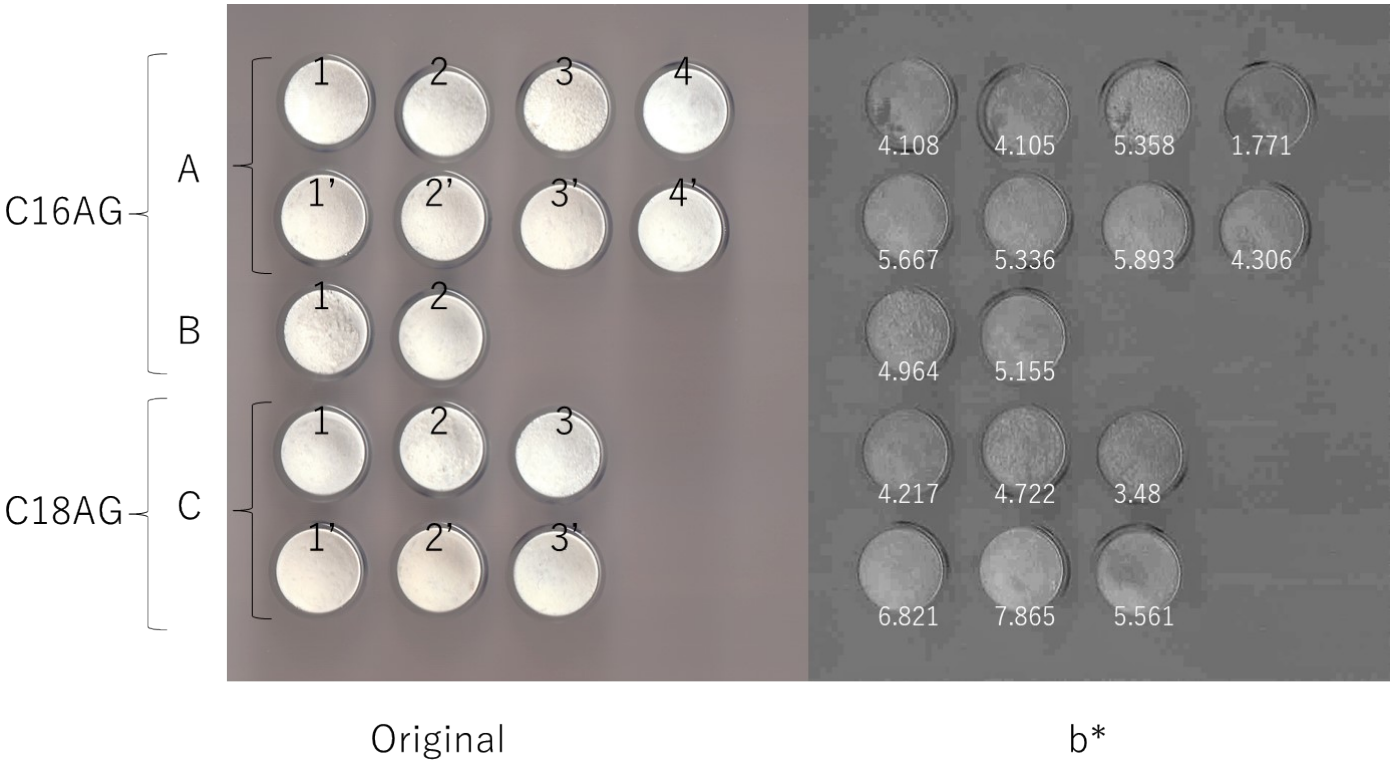


**Fig. 5s** The scan image and converted b* stack image of each sample. A: Scan image and converted b* stack image for measuring yellowness (whiteness) shown in Table 1. B: Scan image and converted b* stack image for measuring the yellowness (whiteness) of the compounds shown in Fig. 4. C: Scan image and converted b* stack image for measuring yellowness (whiteness) shown in Table 2.

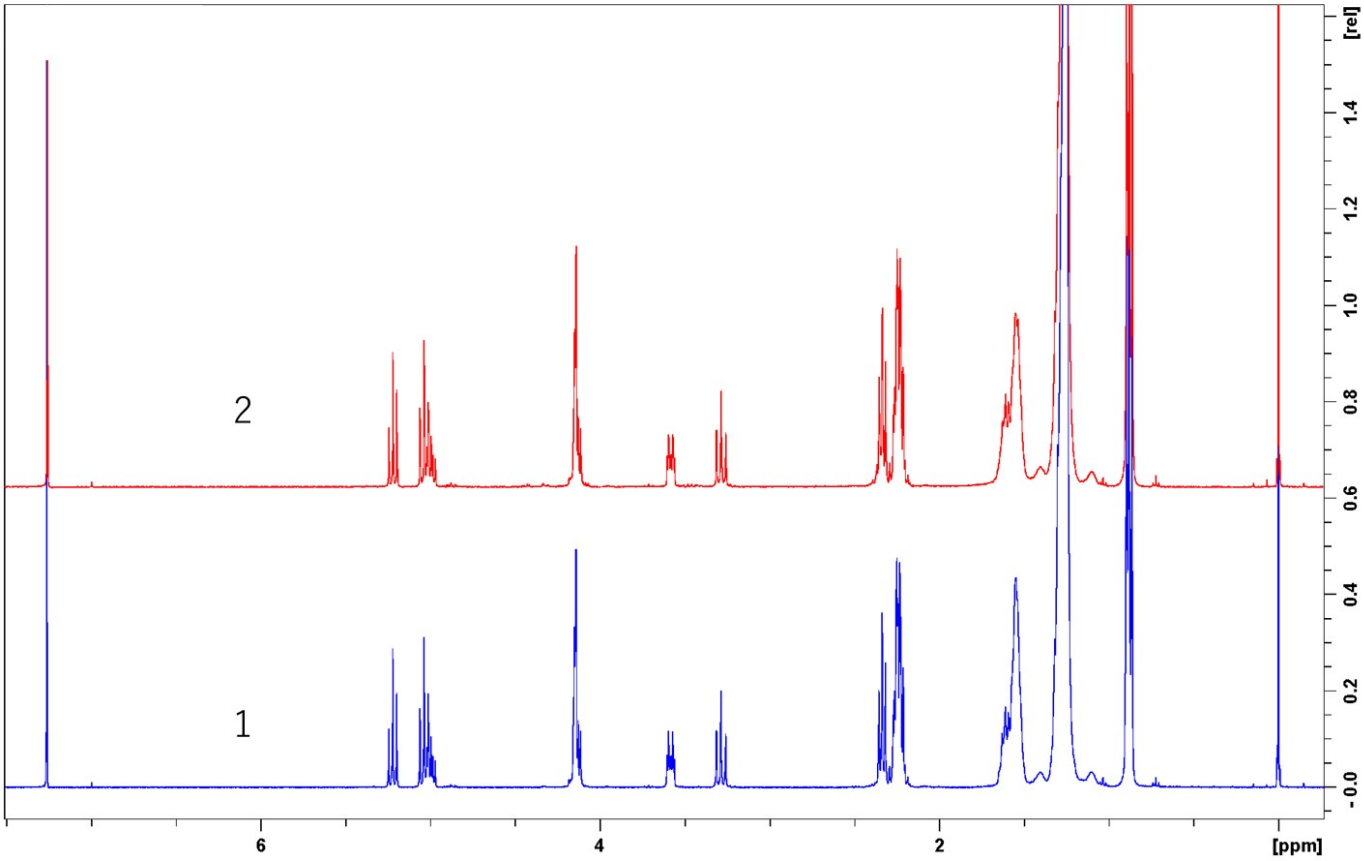


**Fig. 6s** $^{1}$H-NMR spectra of each sample of C16AG in $CDCl_3$ ($Me_4Si$ = 0 ppm). 1: $K_2CO_3$, (Fig. 4, entry 1), 2: NaOH, (Fig. 4, entry 2).

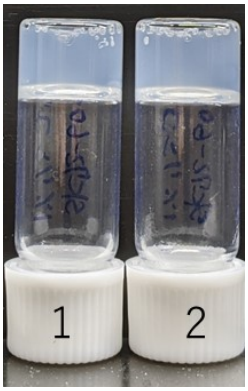


**Fig. 7s** Appearance of gels (1 wt % gel of each sample in diisostearyl malate) in both entries shown in Fig. 4. Both gels did not flow down when inverted.

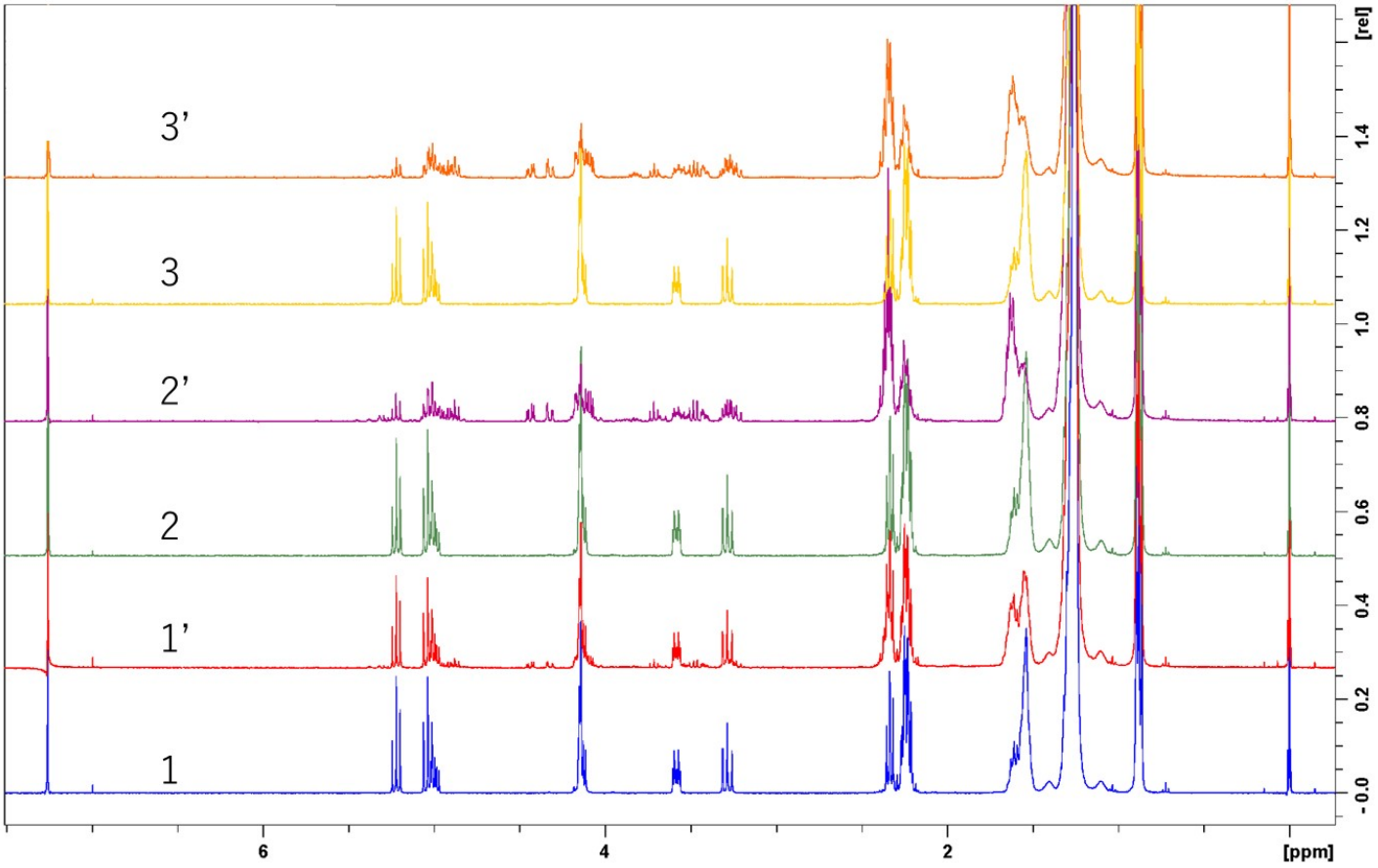


**Fig. 8s** $^{1}$H-NMR spectra of each sample of C18AG in $CDCl_3$ ($Me_4Si$ = 0 ppm). 1: $K_2CO_3$, primary crystal (Table 2, entry 1), 1': $K_2CO_3$, secondary crystal (Table 2, entry 1'), 2: NaOH, primary crystal (Table 2, entry 2), 2': NaOH, secondary crystal (Table 2, entry 2'), 3: noncatalyst, primary crystal (Table 2, entry 3), 3': noncatalyst, secondary crystal (Table 2, entry 3').

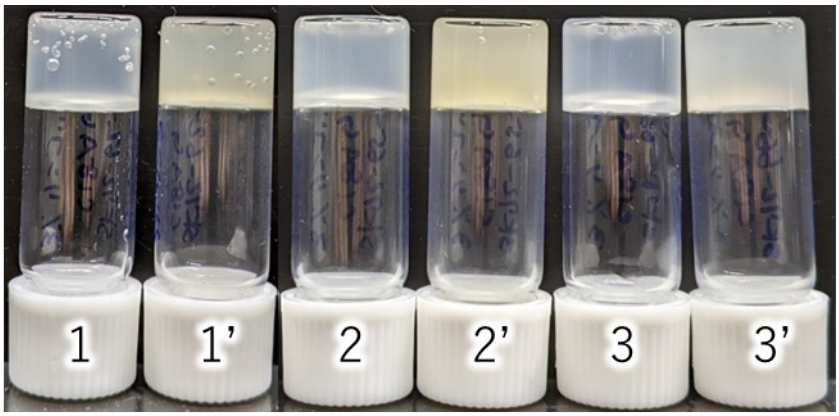


**Fig. 9s** Appearance of the gels (3 wt % gel of each sample in diisostearyl malate) in each entry shown in Table 2. None of the gels flowed down when inverted.

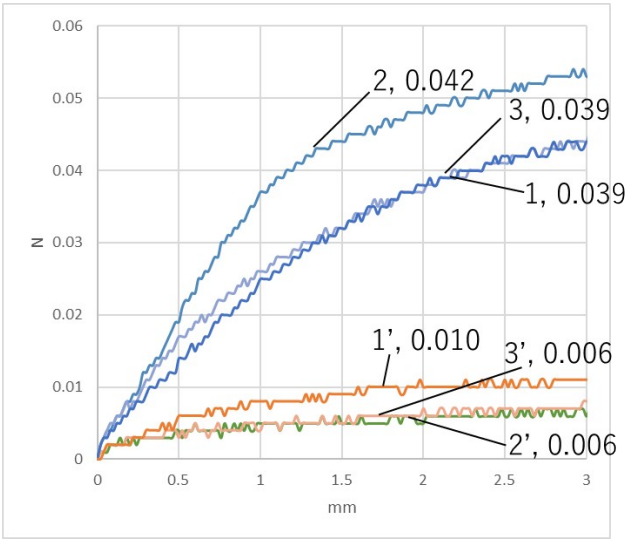


**Fig. 10s** Gel hardness measurement results for each entry are shown in Table 2.

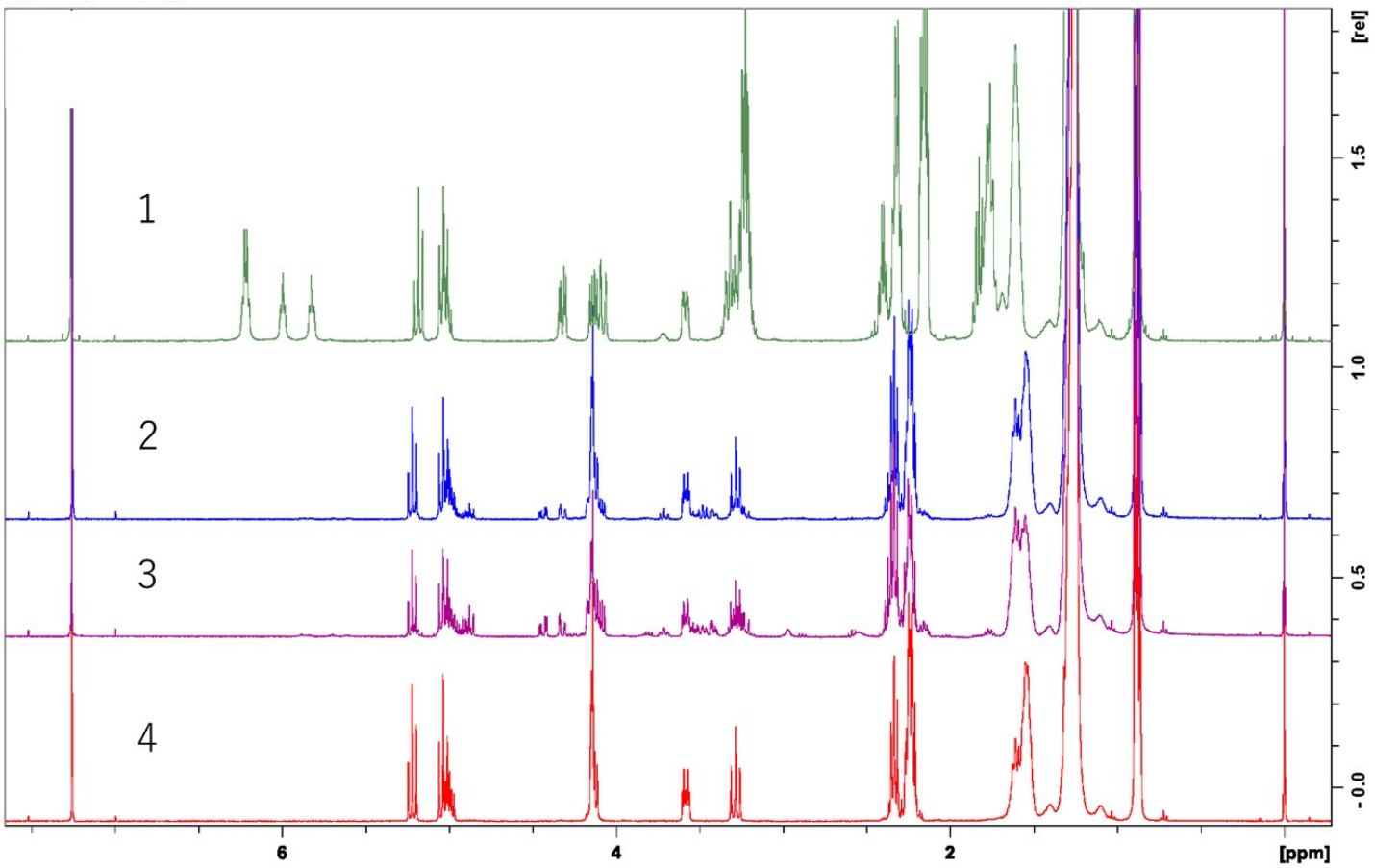


**Fig. 11s** $^{1}$H-NMR spectra of each sample in $CDCl_3$ ($Me_4Si$ = 0 ppm). 1: $C_{16}$GABA-AG standard, 2: Reaction products of 1,5-AG and $C_{16}$GABA by thermal synthesis (with base catalyst), 3: Reaction products of 1,5-AG and $C_{16}$GABA by thermal synthesis (without base catalyst), 4: C16AG standard. In both entries 2 and 3, C16AG was synthesized instead of $C_{16}$GABA-AG.

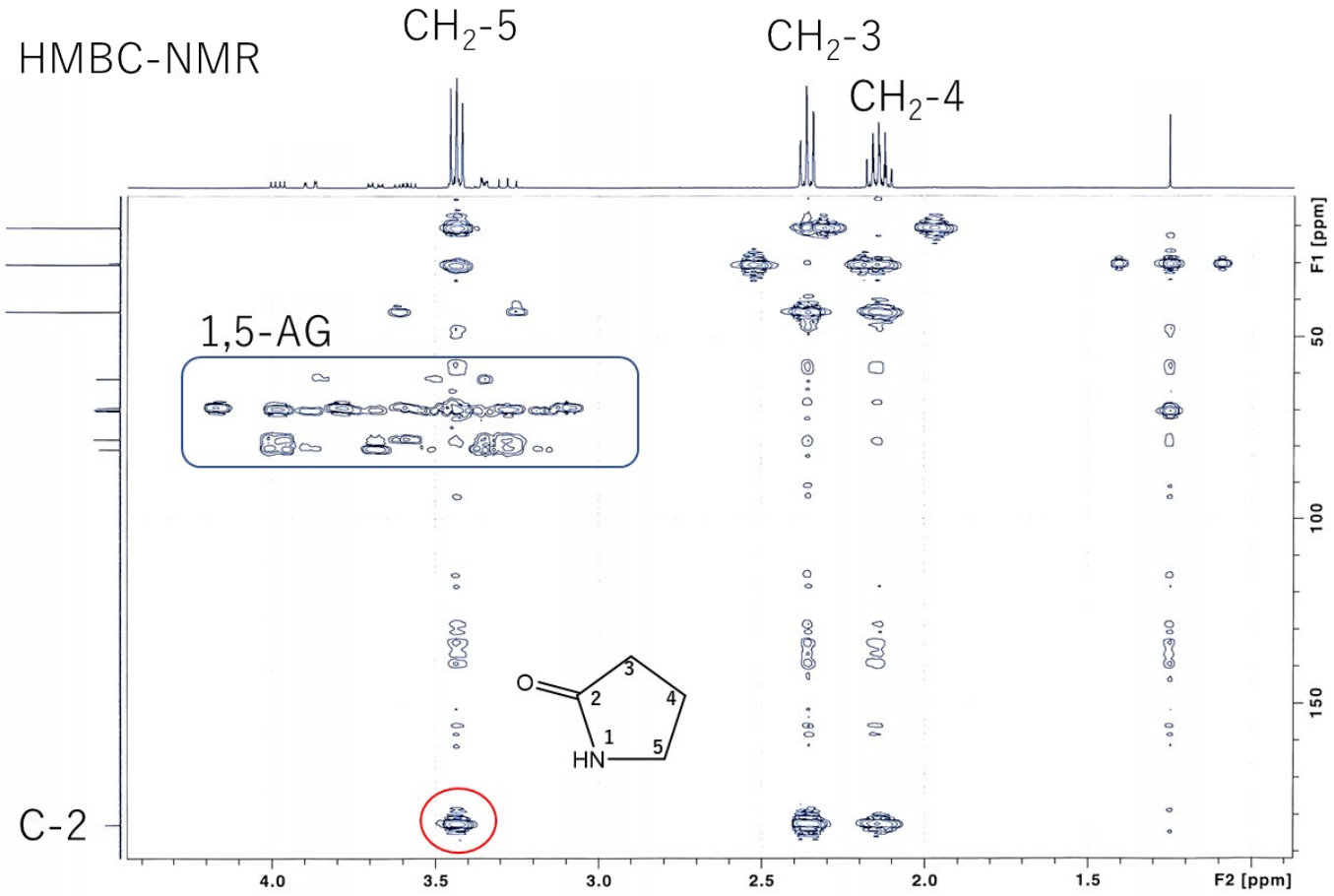


**Fig. 12s** HMBC-NMR spectra of the reaction product of 1,5-AG and GABA by thermal synthesis in $D_2O$ (*t*BuOH = 1.25 ppm, 30.29 ppm). The cross peaks of $CH_2$-5 and C-2 indicate intramolecular cyclization.