

## Supporting Information

### Hydrophilization of Guaiazulene-based Blue Pigment: Improving its Stability in Acidic Condition by Substitution with Polyallylamine

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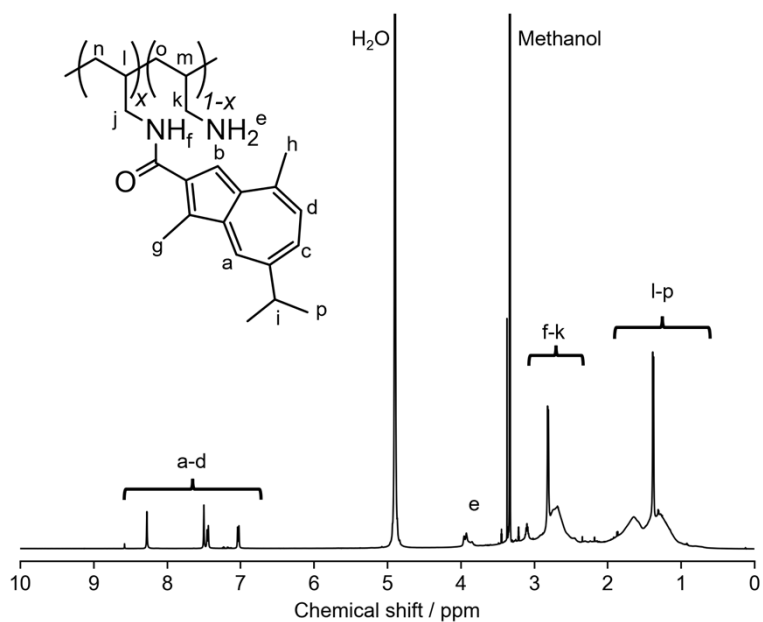
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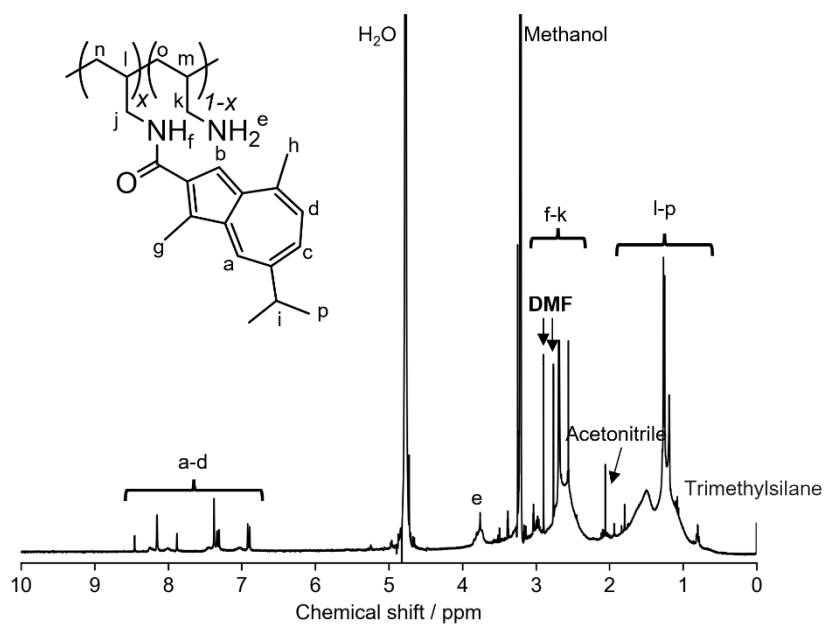
## Materials

Poly(allylamine) was acquired from NITTO BOSEKI Co., Ltd. Guaiazulene, ethanol, sodium hydrogen carbonate, bis(pinacolato)diboron ((Bpin)<sub>2</sub>), diethyl ether, tetrakis(triphenylphosphine) palladium(0) (Pd(PPh<sub>3</sub>)<sub>4</sub>), potassium hydrogenfluoride (KHF<sub>2</sub>), acetone, and tripotassium phosphate (K<sub>3</sub>PO<sub>4</sub>) were obtained from FUJIFILM Wako Pure Chemical Corporation. 4,7-dimethyl-1,10-phenanthroline (Dmphen), and (1,5-cyclooctadiene)(methoxy)iridium(I) dimer ([Ir(OMe)(cod)]<sub>2</sub>) were obtained from Tokyo Chemical Industry Co., Ltd. Acetonitrile, anhydrous magnesium sulfate, chloroform, dimethylformamide (**DMF**), potassium hydroxide, toluene, hexane, tetrahydrofuran (**THF**), potassium carbonate, methanol (MeOH), ethyl acetate (EtOAc) and heptane were purchased from Nacalai Tesque Inc. Chloroform-*d*<sub>1</sub>, 4-(4,6-dimethoxy-1,3,5-triazin-2-yl)-4-methylmorpholinium chloride (**DMT-MM**), and dimethyl sulfoxide-*d*<sub>6</sub> were obtained from Kanto Chemical Co. Silica gel plates (60F254) for thin layer chromatography were acquired from Merck, and silica gel 60 N (40–50 and 63–210 μm) for flash chromatography was purchased from Kanto Chemical Co. For all reagents, they were used with no further purification, as received.

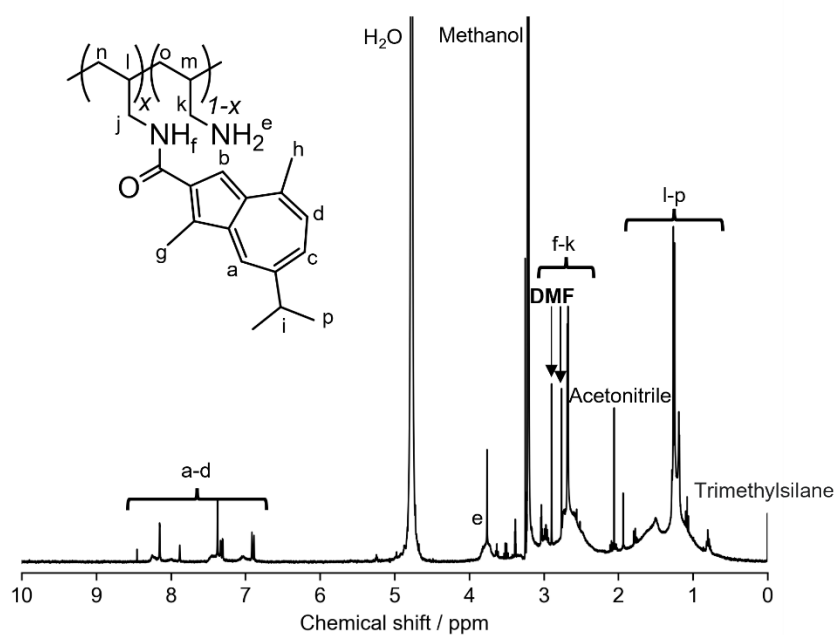
## NMR spectra of synthesized compounds



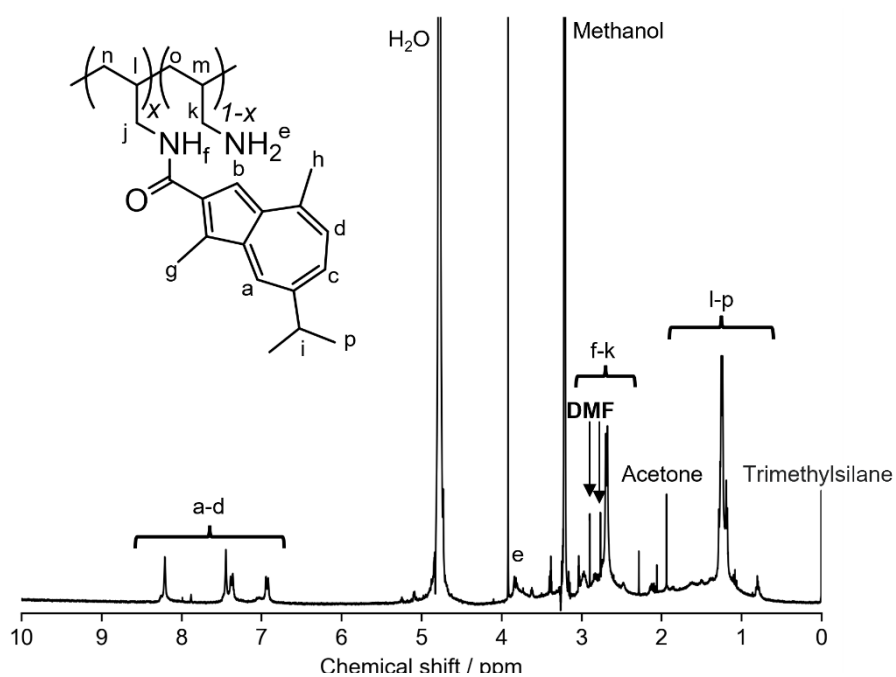
**Figure S1.** 400 MHz <sup>1</sup>H NMR spectrum (methanol-*d*<sub>4</sub>) of **PGA2-1**



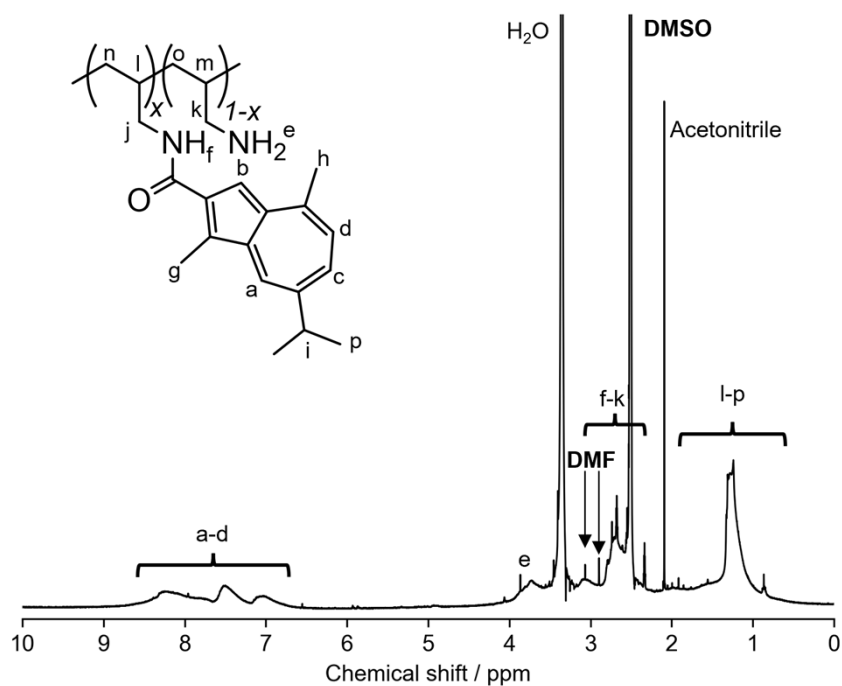
**Figure S2.** 400 MHz <sup>1</sup>H NMR spectrum (methanol-*d*<sub>4</sub>) of **PGA2-2**



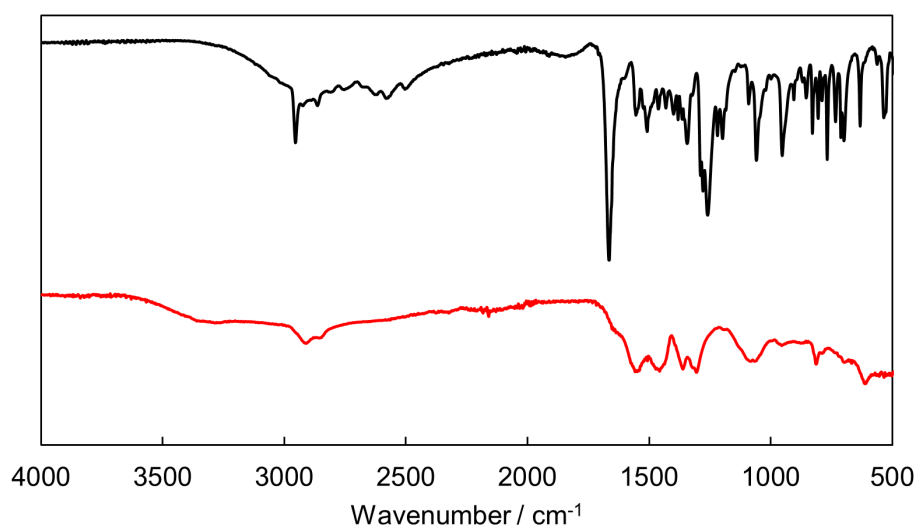
**Figure S3.** 400 MHz  $^1H$  NMR spectrum (methanol- $d_4$ ) of **PGA2-3**



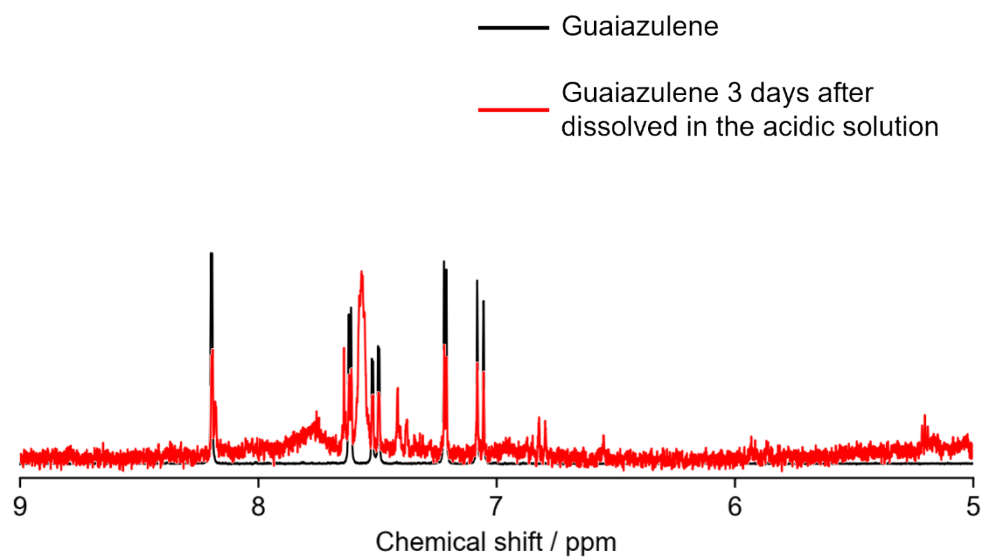
**Figure S4.** 400 MHz  $^1H$  NMR spectrum (methanol- $d_4$ ) of **PGA2-4**



**Figure S5.** 400 MHz  $^1\text{H}$  NMR spectrum (dimethyl sulfoxide- $d_6$ ) of **PGA2-5**



**Figure S6.** IR spectra of **GA-2-COOH** (black line) and **PGA2-1** (red line)



**Figure S7.**  $^1\text{H}$  NMR spectra of Guaiazulene (black line) and Guaiazulene 3 days after dissolved in the acidic solution (red line)