Electronic Supplementary Material (ESI) for Organic & Biomolecular Chemistry.
This journal is © The Royal Society of Chemistry 2014

Electronic Supplementary Information

Solvent- and Phase-Controlled Photochirogenesis. Enantiodifferentiating Photoisomerization of (*Z*)-Cyclooctene Sensitized by Cyclic Nigerosylnigerose-Based Nanosponges with Pyromellitate Crosslinker

Xueqin Wei,[a] Wenting Liang,[b] Wanhua Wu,[a] Cheng Yang,*[a] Francesco Trotta,*[c] Fabrizio Caldera,[c] Andrea Mele,[d] Tomoyuki Nishimoto[e] and Yoshihisa Inoue*[f]

[a] *State Key Laboratory of Biotherapy, West China Medical School and Key Laboratory of Green Chemistry & Technology of Ministry of Education, College of Chemistry, Sichuan University, 29 Wangjiang Road, Chengdu 610064, China. E-mail: yangchengyc@scu.edu.cn*
[b] *Institute of Environmental Sciences, Shanxi University, Taiyuan 030006, China*
[c] *Department of Chemistry, University of Torino, Via P. Giuria 7, 10125 Torino, Italy. E-mail: francesco.trotta@unito.it*
[d] *Department of Chemistry, Materials and Chemical Engineering "Giulio Natta", Politecnico di Milano, Piazza L. Da Vinci 32, 20133 Milano, Italy*
[e] *Hayashibara Co., 675-1 Fujisaki, Naka-ku, Okayama 702-8006, Japan*
[f] *Department of Applied Chemistry, Osaka University, 2-1Yamada-oka, Suita 565-0871, Japan. E-mail: inoue@chem.eng.osaka-u.ac.jp*

Table of Contents

Elemental analysis

Instrument: Thermo Scientific - FlashEA1112.

CNN-NS	Sample #	% N	% C	% H	% S
6	1	3.20	49.46	6.75	0.00
	2	3.16	49.30	6.75	0.00
7	1	3.01	50.89	5.95	0.00
	2	3.09	51.36	6.07	0.00

Discussion: Two independent analyses of each CNN-NS gave essentially the same results, indicating the homogeneity of the polymer samples obtained. The nitrogen detected for both CNN-NSs arise from the triethylamine employed as a base in the CNN-NS synthesis, which eventually forms an ammonium salt with the carboxylic group remaining in CNN-NS. From the nitrogen contents observed (3.0-3.2%), 44% and 27% of the four carboxylic groups in pyromellitic acid are considered to form ammonium salt in CNN-NSs **6** and **7**, respectively.

ATR-FTIR analysis

Instrument: PerkinElmer Spectrum 100 FT-IR.

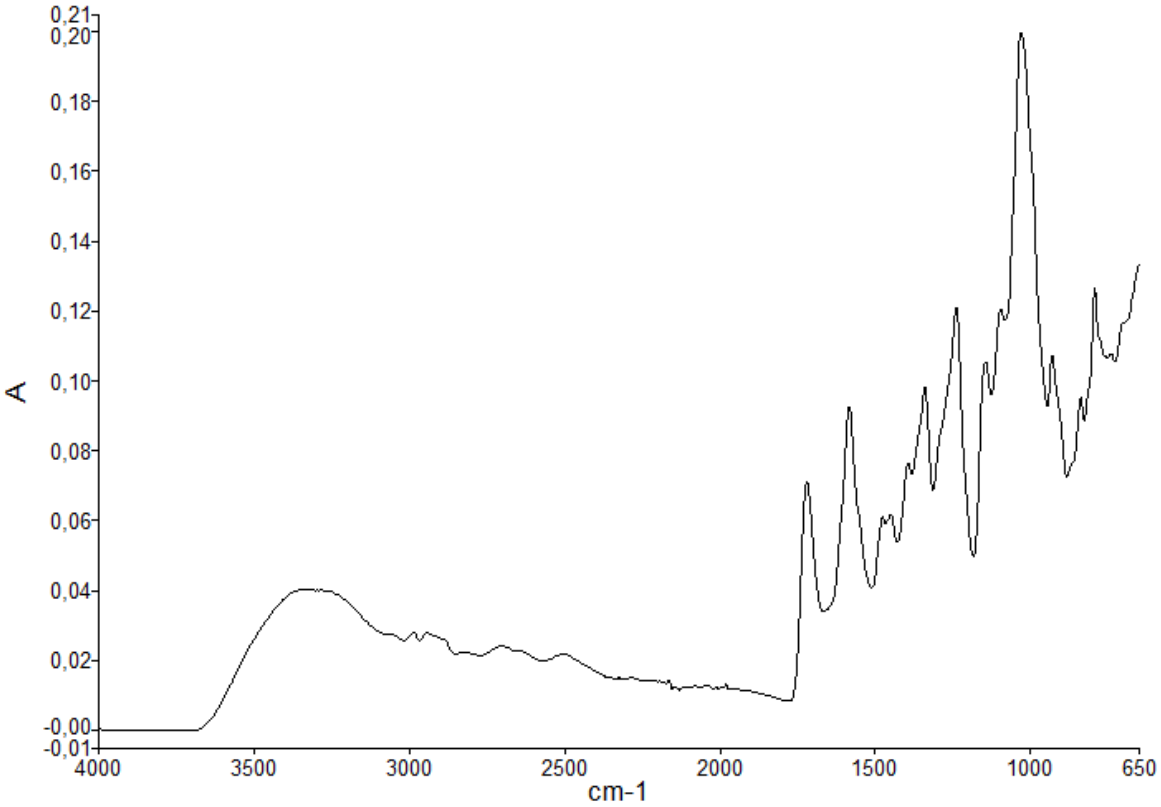

Figure S1. ATR-FTIR spectrum of CNN-NS **6**.

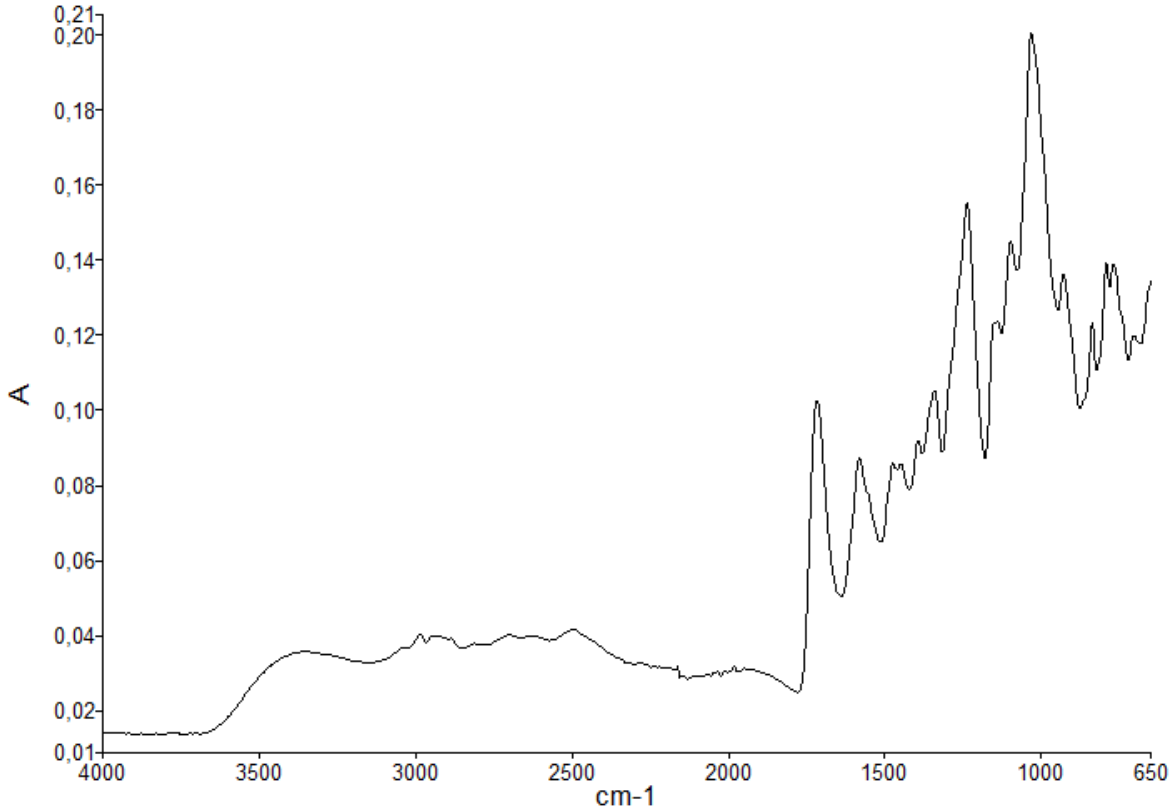

Figure S2. ATR-FTIR spectrum of CNN-NS **7**.

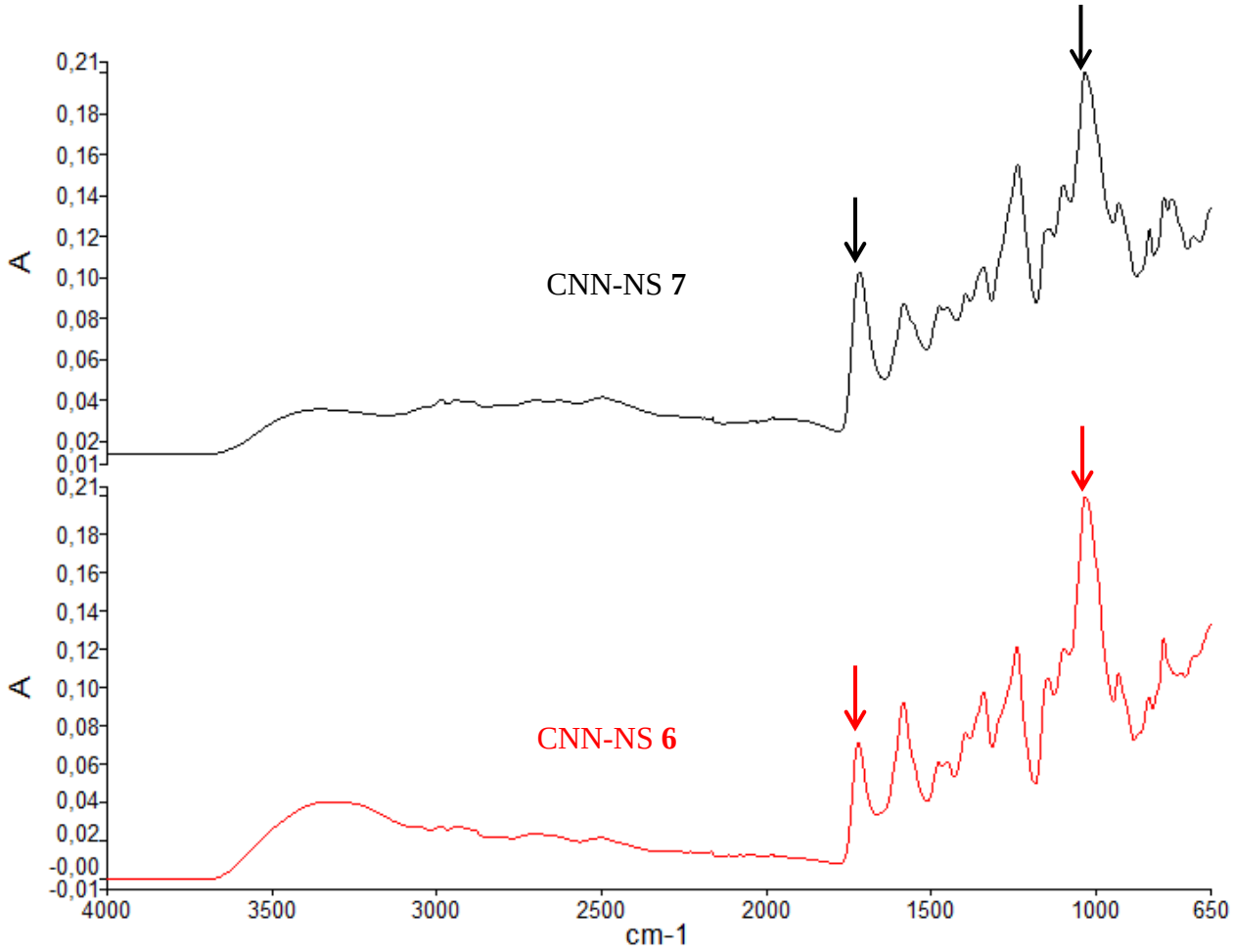

Figure S3. Comparison of the ATR-FTIR spectra of CNN-NSs **6** (bottom) and **7** (top).

Discussion: As can be seen from Figure S3, the relative intensity of carbonyl stretching band at ca. 1720 cm^{-1}, against the C-O stretching band at ca. 1000 cm^{-1}, is stronger by a factor of 1.5 for CNN-NS **7** (prepared by using the CNN:PDA raio of 1:4) than for CNN-NS **6** (prepared by using the CNN:PDA raio of 1:2), indicating the presence of a larger content of pyromellitate unit in **7**.

Thermogravimetric analysis (TGA)

Instrument: TA Instruments 2050 TGA V5.4A. Program: equilibrate at 40°C, ramp 10°C/min to 700°C under nitrogen atmosphere.

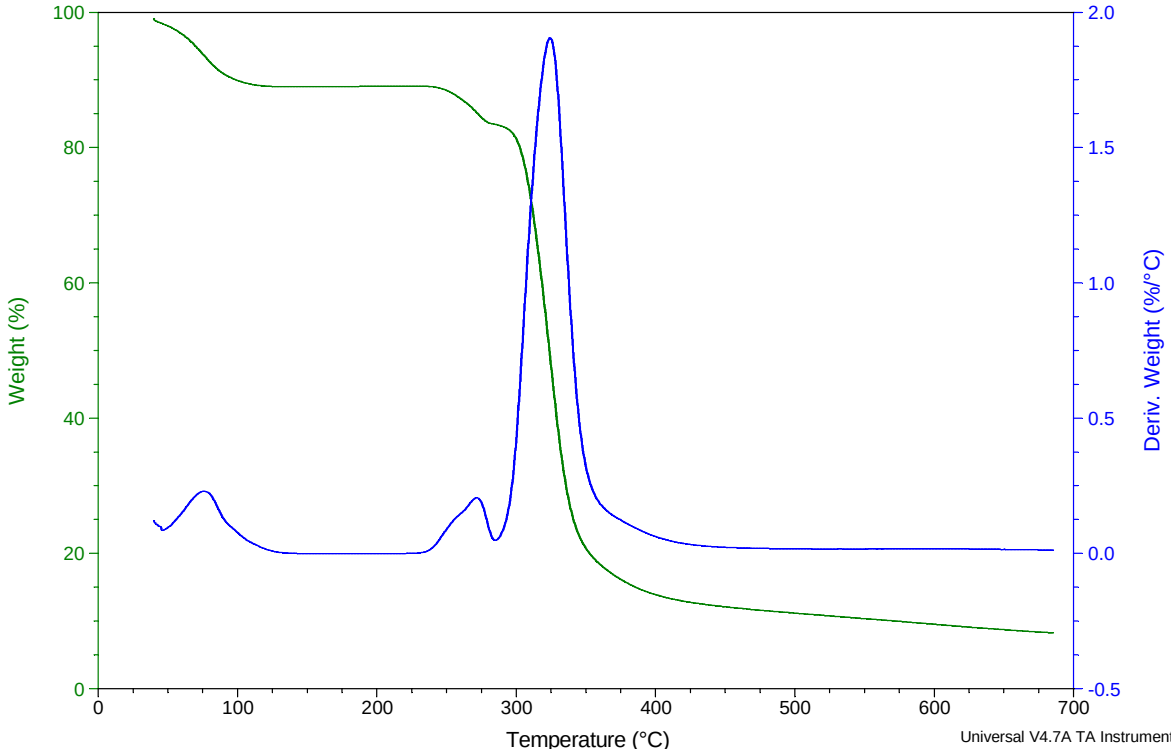

Figure S4. TGA of CNN (green line) and derivative curve (blue line). Amount of adsorbed water: 11.01 %.

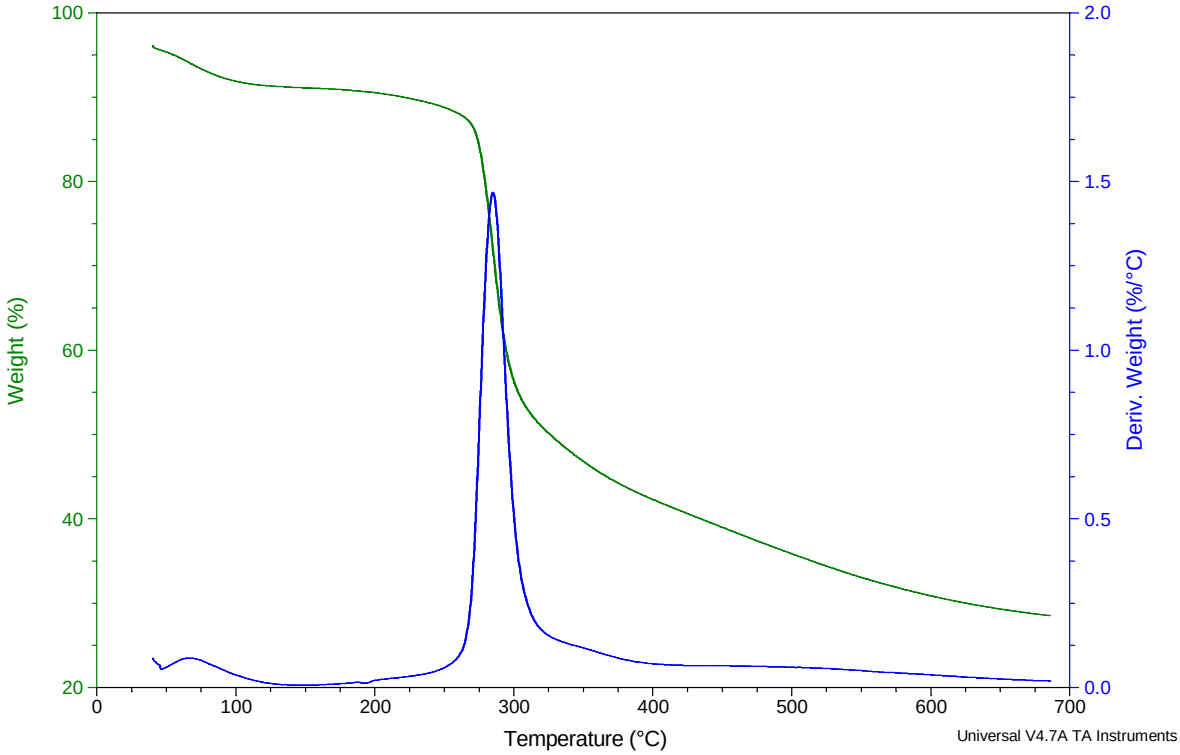

Figure S5. TGA of CNN-NS **6** (green line) and derivative curve (blue line). Amount of adsorbed water: 8.89 %.

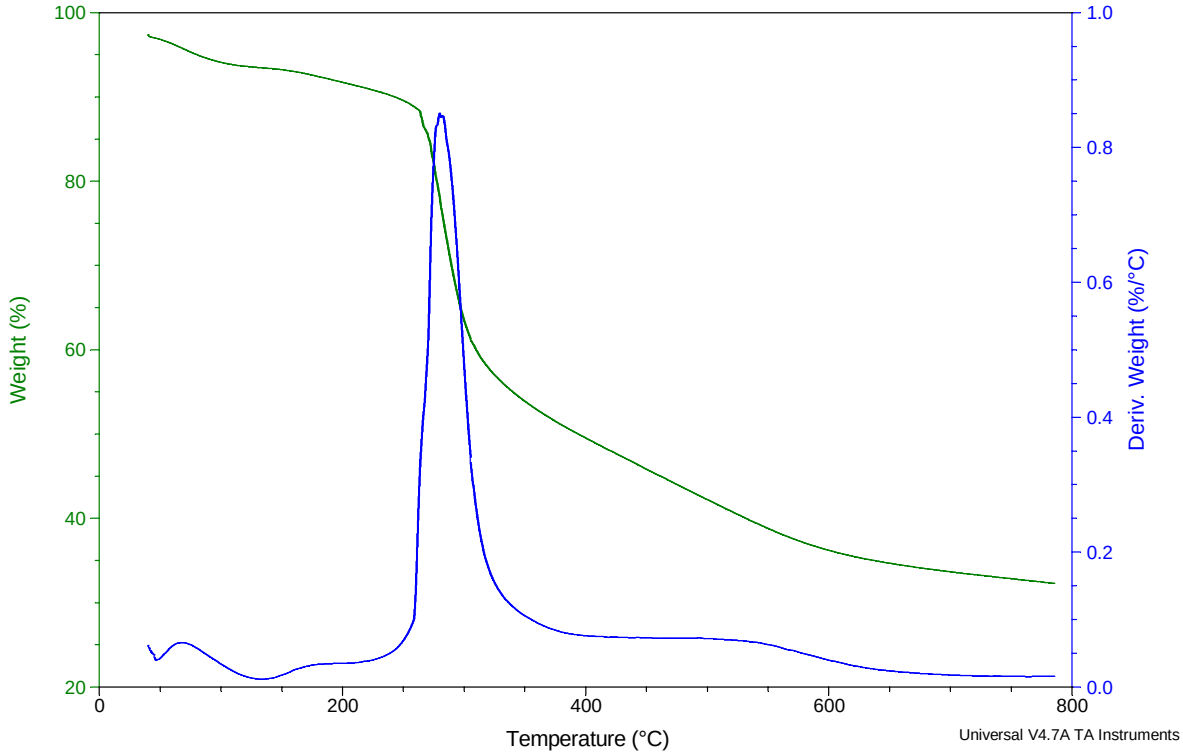

Figure S6. TGA of CNN-NS **7** (green line) and derivative curve (blue line). Amount of adsorbed water: 6.77%

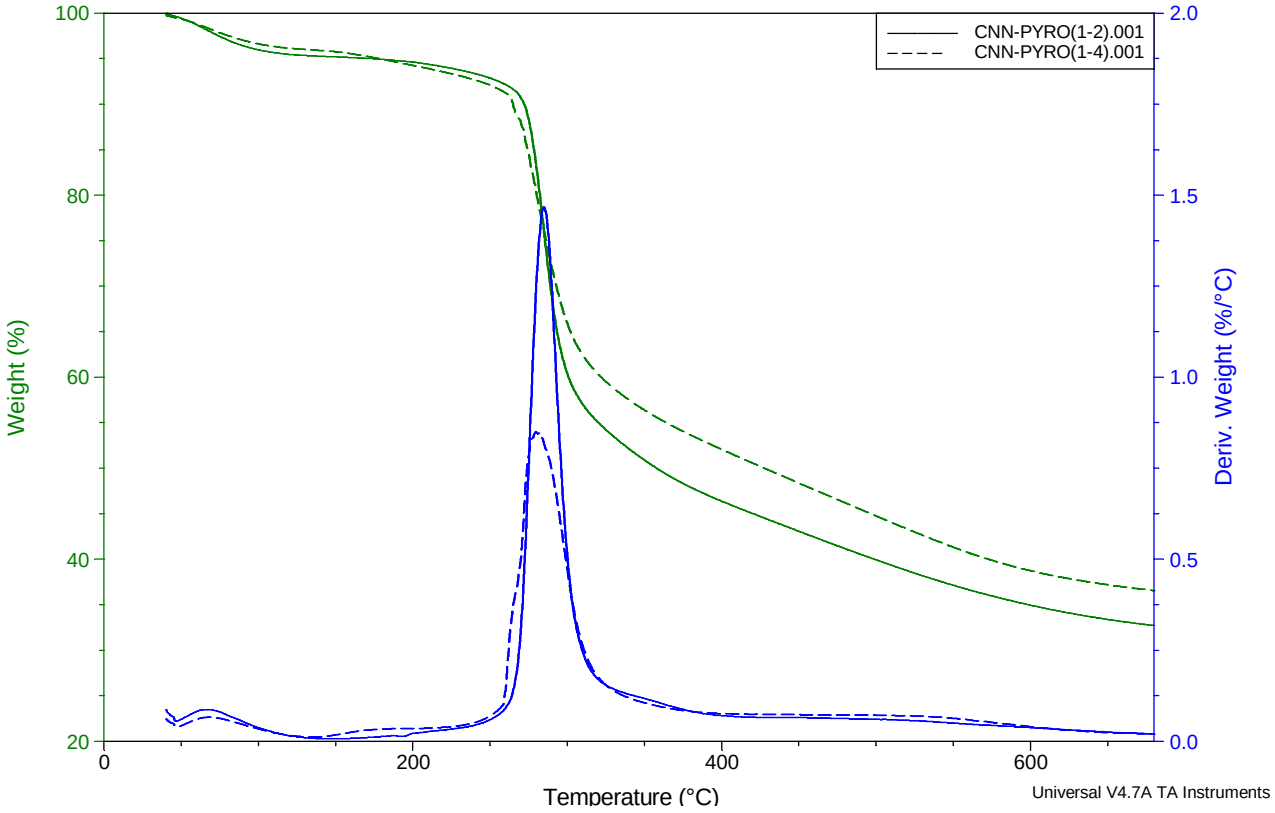

Figure S7. Comparison of TGAs for CNN-NSs **6** and **7**.

Discussion: In both polymers, degradation started at 250-260°C but CNN-NS **7** gave a larger residue at 680°C than CNN-NS **6**, indicating more extensive crosslinking for **7**.