

**Renewable Protein-Based Monomer for Thermosets: a case study on
phthalonitrile resin**

Weifeng Peng, Fang Yao, Jianghuai Hu, Zheng Lu, Yang Liu, Zhengzhou Liu Ke
Zeng*, Gang Yang*

*State Key Laboratory of Polymer Materials Engineering, College of Polymer Science
and Engineering, Sichuan University, Chengdu, 610065, P. R. China*

*Corresponding author: (1) e-mail: zk_ican@sina.com (Ke Zeng); (2) e-mail:
yanggang65420@163.com (Gang Yang), phone +86-28-85469766, Fax +86-28-
85469766

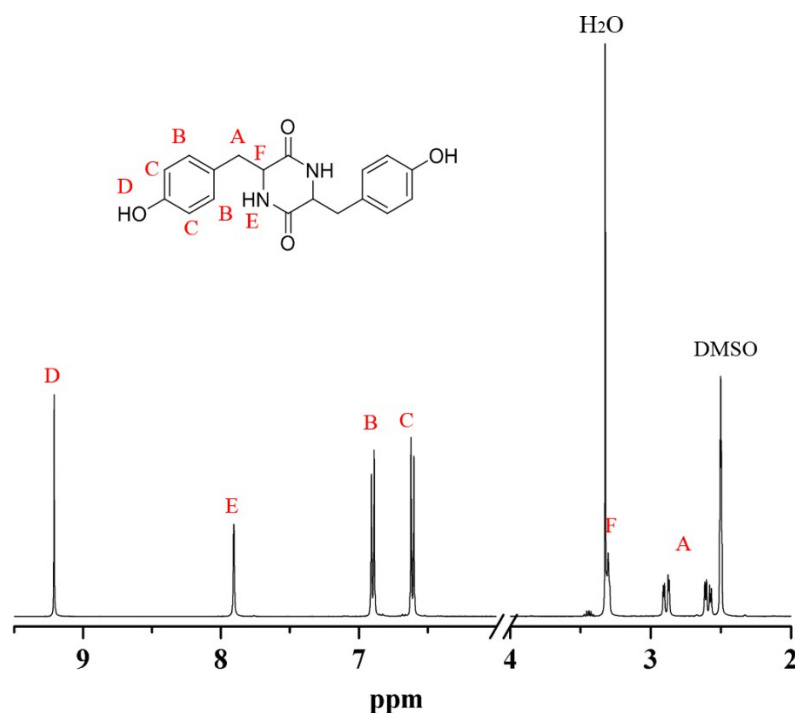


Fig. S1. ¹H NMR spectrum of L-tyrosine cyclic dipeptide.

The ¹H NMR spectra of cyclic dipeptide is shown in Fig. S1. Fig. S1 indicates that the hydroxyl protons of cyclic dipeptide appear at 9.21 (s, 2H), the secondary amine protons appear at 7.91 (s, 2H), aromatic protons at 6.5-6.9 ppm. The L-tyrosine cyclic dipeptide specimen also shows the methylene (-CH₂-) characteristic signals at 2.88 and 2.59 ppm, the methine (-C(N)H-) characteristic signals at 3.31 ppm,

respectively. We can conclude that the L-tyrosine cyclic dipeptide was successfully synthesized from FTIR and ^1H NMR spectrum.

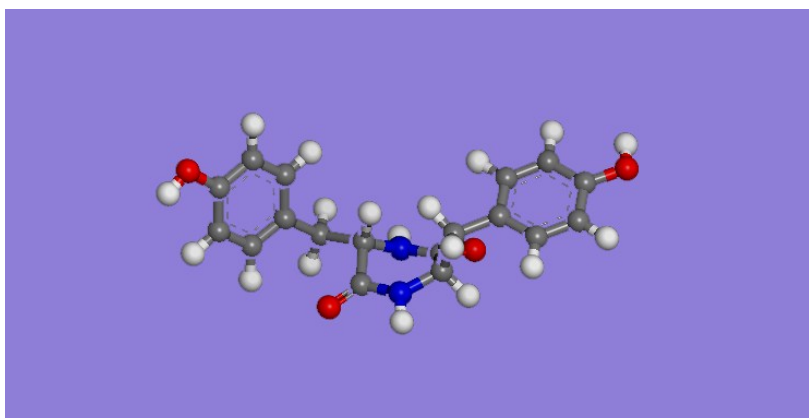


Fig. S2. The stereochemical structure of L-tyrosine cyclic dipeptide

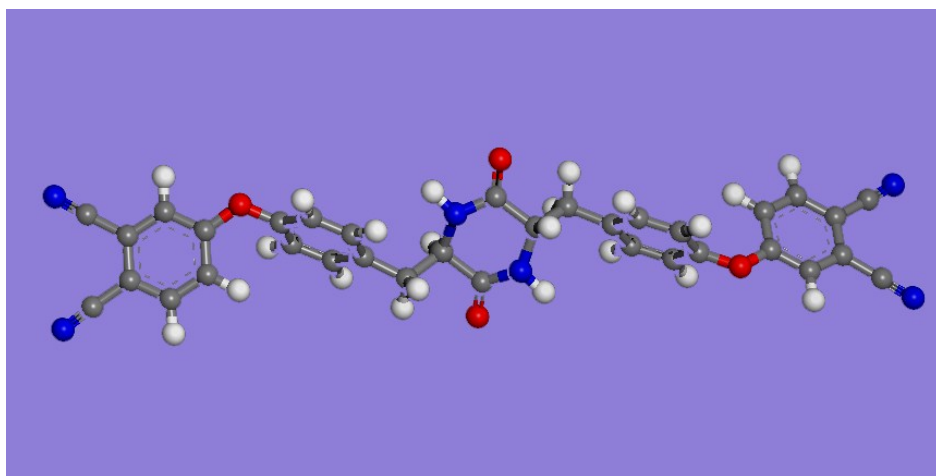


Fig. S3. The stereochemical structure of TPN monomer

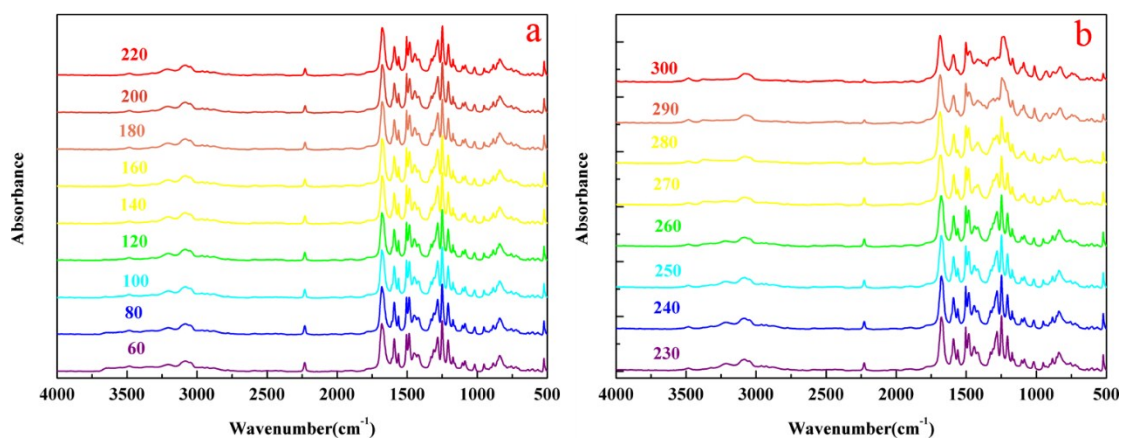


Fig. S4. The in-situ FTIR of TPN monomer heated from 60-220 °C scanned with 20 °C interval and from 230-300 °C with 10 °C interval.