

High refractive index diphenyl sulfide photopolymers for solar cell antireflection coatings

Jingran Zhang ^{1,2}, Baozhu Li ^{3#}, Heran Song¹, Chen Zhao ^{1, *}, Songfeng Liang¹, ZhuRong Dong ^{1, **}, Jie Yu²

¹ Research Institute of New Energy Vehicle Technology, Shenzhen Polytechnic, Shenzhen, 518055, China

² Key Laboratory of Optoelectronic Chemical Materials and Devices of Ministry of Education, Jiangnan University, Wuhan, 430056 P. R. China

³ Zhuhai Fudan Innovation Institute, Zhuhai, 518057 China

* Correspondence: zhaochen913@163.com (C.Z.); arondong@szpt.edu.cn (Z.R.D.)

1. Synthesis and characterization of photopolymers

As shown in Figure S1 (DGETDBT), the signals at 7.33~7.35 ppm, and 7.23~7.25 ppm belong to the benzene ring and the connection appears at 3.12~3.16 ppm. The methylene group, and the epoxy-linked methylene group appear at 2.65 ppm and 2.80 ppm, respectively. In addition, the epoxy-linked methine group appears at 2.95~3.00 ppm. The result is the same as the one reported in article.

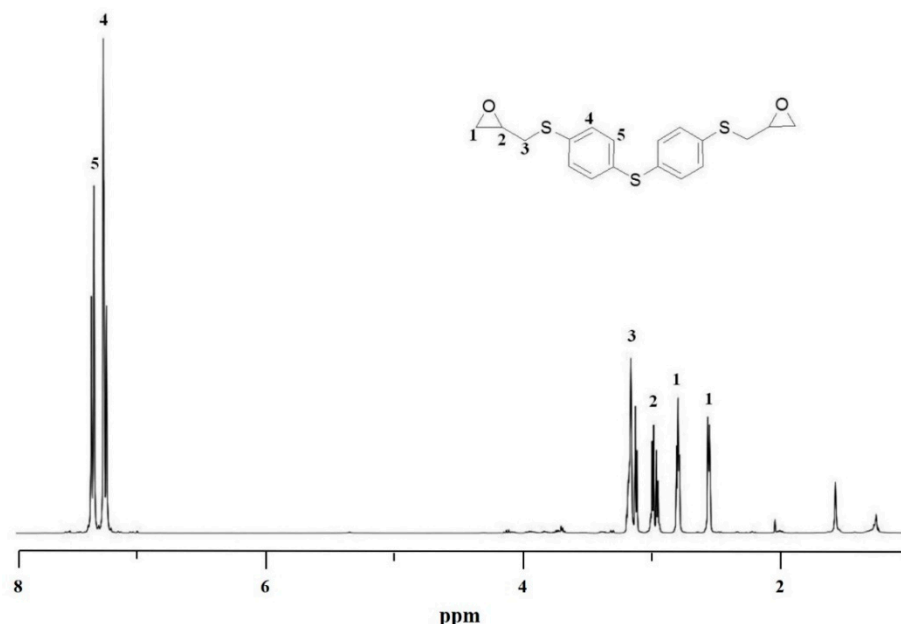


Figure S1. ¹H-NMR spectra of DGETDBT.

As shown in Figure S2, the aromatic protons of EA-UV appear as doublet at approximately

7.33~7.35 ppm and 7.23~7.25 ppm. The characteristic peaks of olefins appear at 6.40 ppm, 6.05 ppm, and 5.80 ppm. The singlet at 5.37 ppm is caused by the hydroxyl group produced after epoxy ring opening. Two methylene groups appear at 4.41 ppm and 4.24 ppm, a hydroxyl group-connected methine group appears at 4.49 ppm, and a thioether-connected methylene group appears at 3.12~3.16 ppm.

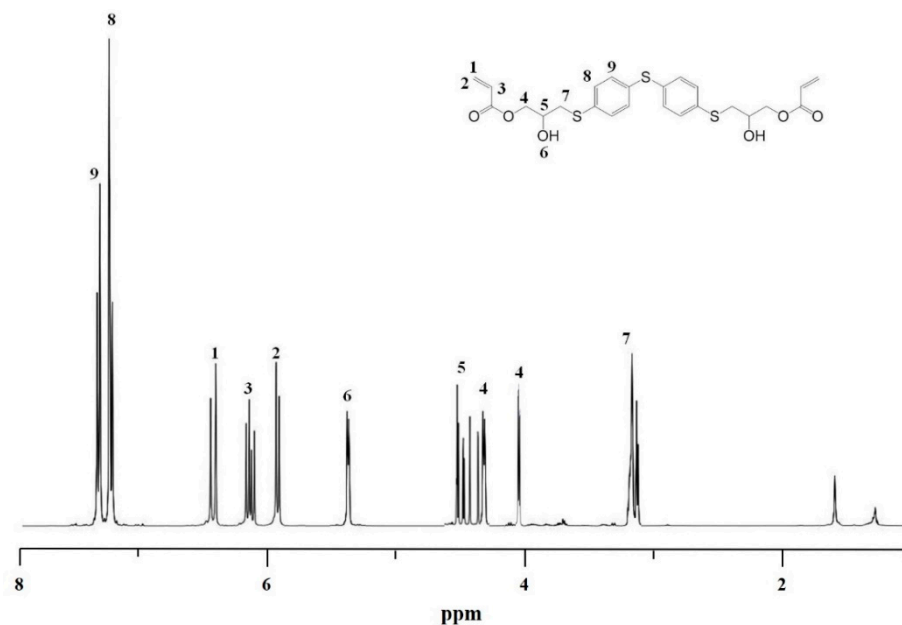


Figure S2. ^1H -NMR spectra of EA-UV.

Figure S3 presents the ^1H NMR spectrum of AOI-UV. The characteristic peak at 3.12 ppm originated from the methylene connected to the sulfide unit, and the signals of the benzene ring in diphenyl sulfide unit are observed at 7.23 to 7.35 ppm, while the peaks of olefins connected to carbonyl appear at 6.40 ppm, 6.05 ppm and 5.80 ppm. The signal peaks of methylene groups are observed at 4.41 ppm, and 4.24 ppm, and the signals of methylene groups connected to oxazolidone rings could be seen at 3.2 ppm. Moreover, the signals of methylene attached to the oxygen atom appear at 4.86 ppm. These results confirm that DGETDBT successfully reacted with isocyanate ethyl acrylate to form AOI-UV.

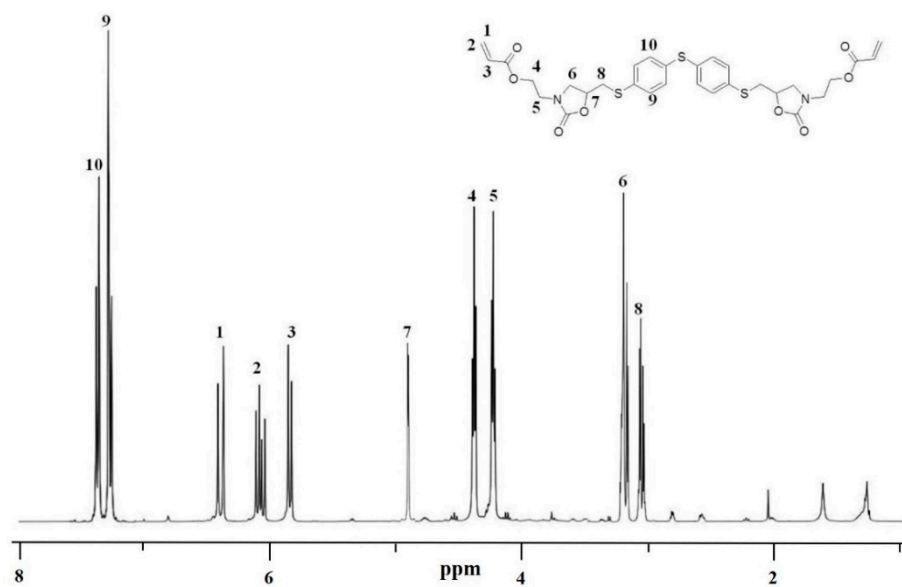


Figure S3. ^1H -NMR spectra of AOI-UV.