

Supporting Information

Highly sensitive and repeatable recording photopolymer for holographic data storage containing N-Methylpyrrolidone

Junchao Jin,^{‡a} Po Hu,^{‡ab} Haiyang Song,^a Jinhong Li,^a Junhui Wu,^a Zeyi Zeng,^a

Qingdong Li,^a Li Wang,^a Xiao Lin^{*a} and Xiaodi Tan^{*ac}

a College of Photonic and Electronic Engineering, Fujian Normal University, Fuzhou 350117, China. E-mail: xiaolin@fjnu.edu.cn

b Henan Provincial Key Laboratory of intelligent lighting, Huanghuai University, Zhumadian 463000, China

c Information Photonics Research Center, Key Laboratory of Opto-Electronic Science and for Medicine of Ministry of Education, Fujian Provincial Key Laboratory of Photonics Technology, Fujian Provincial Engineering Technology Research Center of Photoelectric Sensing Application, Fujian Normal University, Fuzhou 350117, China. E-mail: xtan@fjnu.edu.cn

[‡] These authors contributed equally to this work.

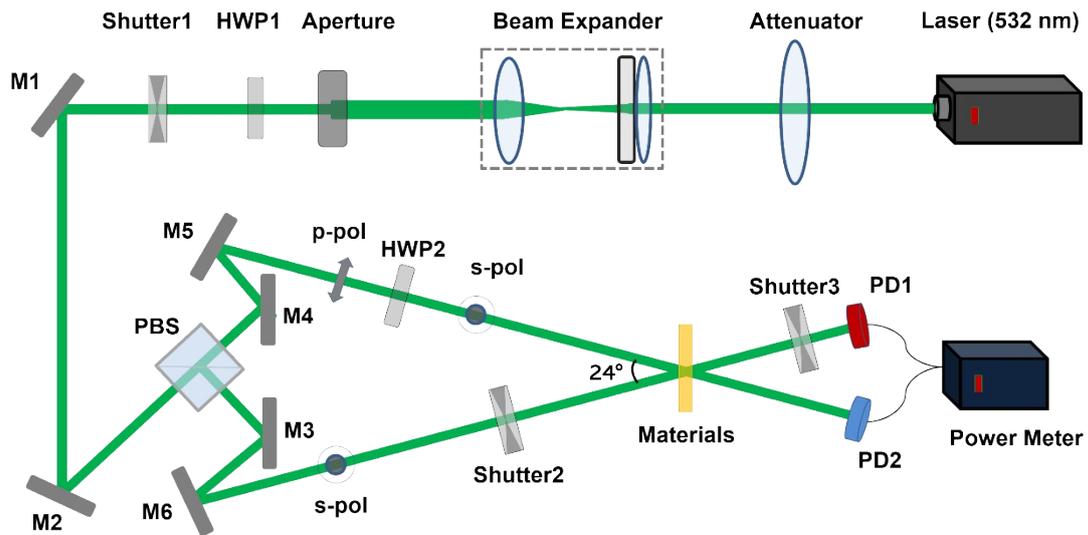


Figure S1. Experimental setup for diffraction efficiency measurement, where HWP: halfwave plate; PBS: polarization beam splitter; PD: photo detector. The sample can rotation across Z axle by Sigma rotation stage.

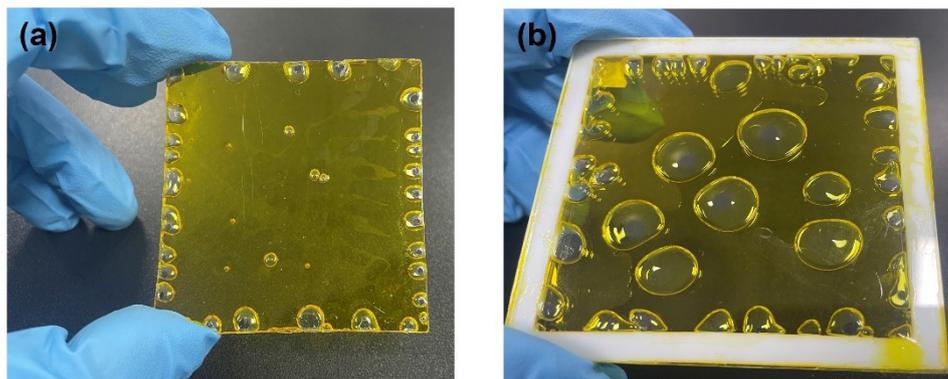


Figure S2. Molding of NMP-PQ/PMMA materials after heat curing (a) 25 wt% NMP-PQ/PMMA. (b) 30 wt% NMP-PQ/PMMA.

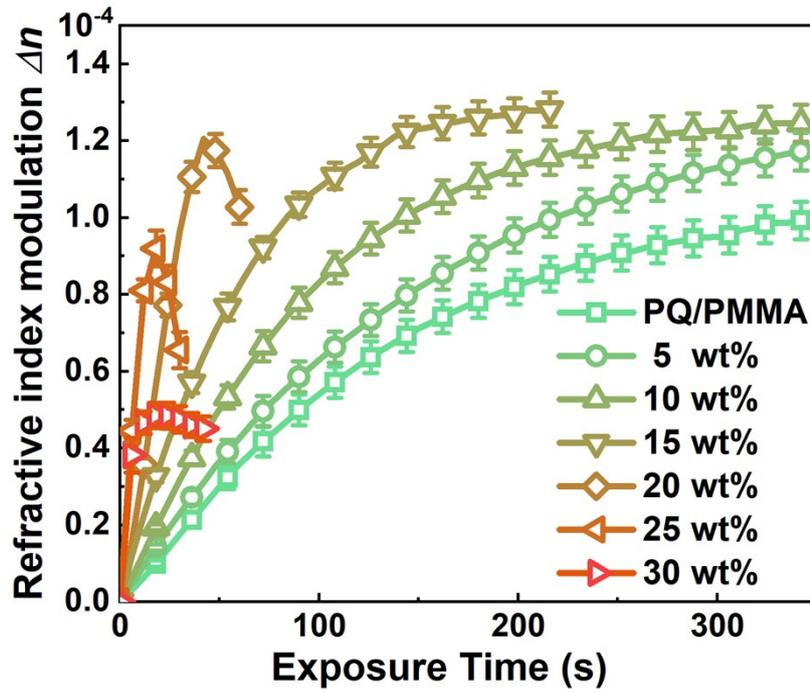


Figure S3. Exposure time-dependent refractive index modulation of different concentration of NMP-PQ/PMMA.

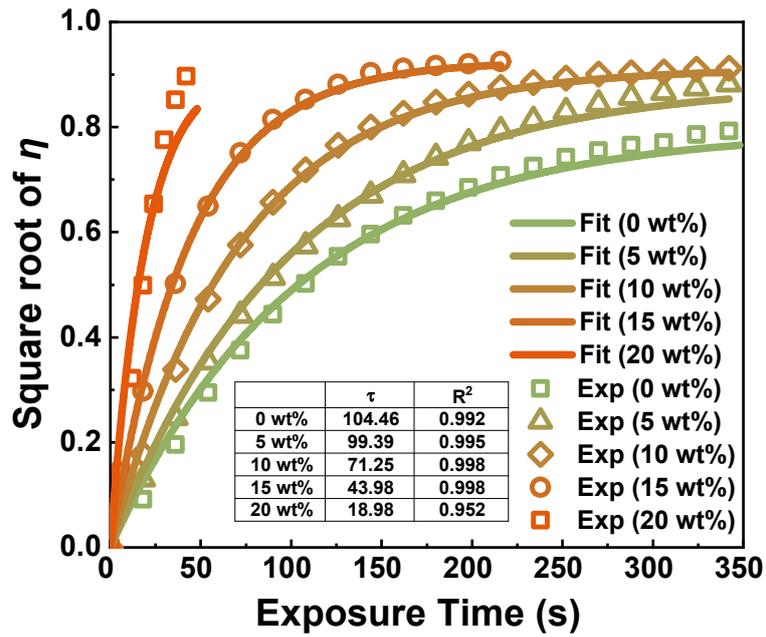


Figure S4. Response time fitting curves of different concentration of NMP-PQ/PMMA.

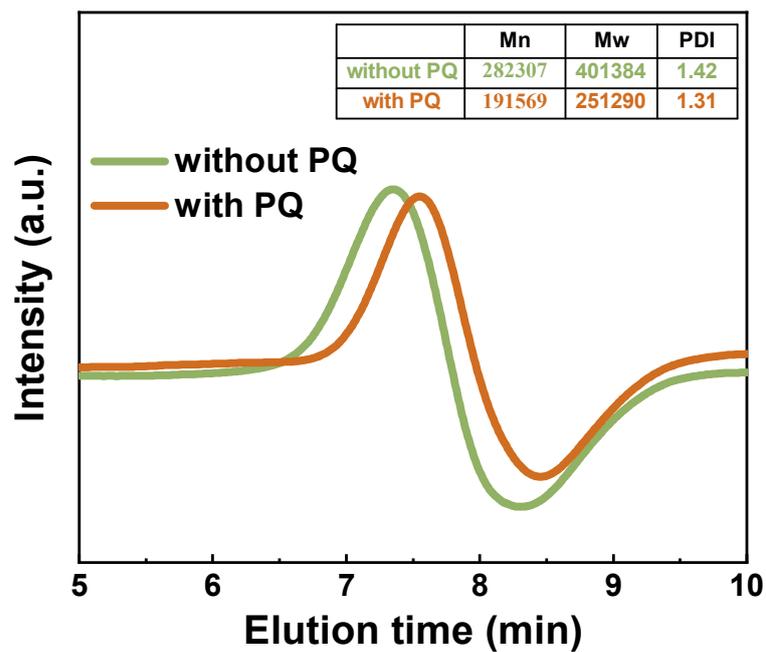


Figure S5. GPC curves for prepolymerization with and without PQ.

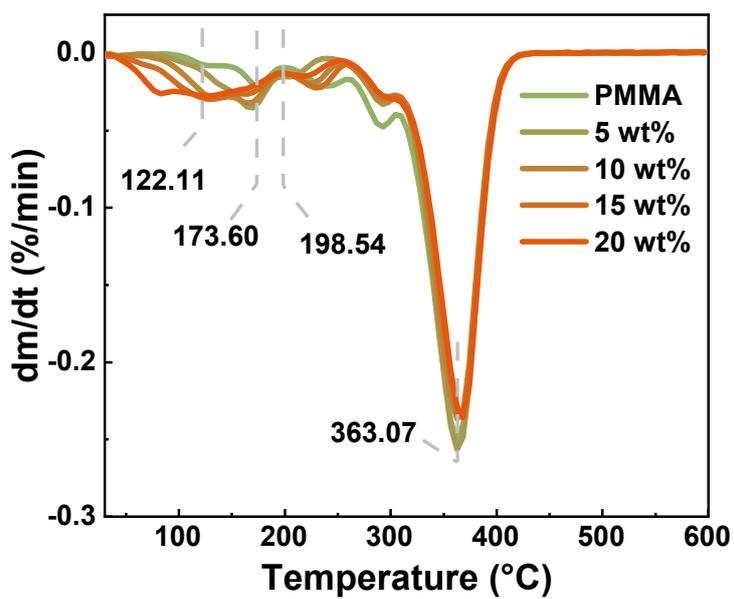


Figure S6. DTG results of different concentration of NMP-PMMA.

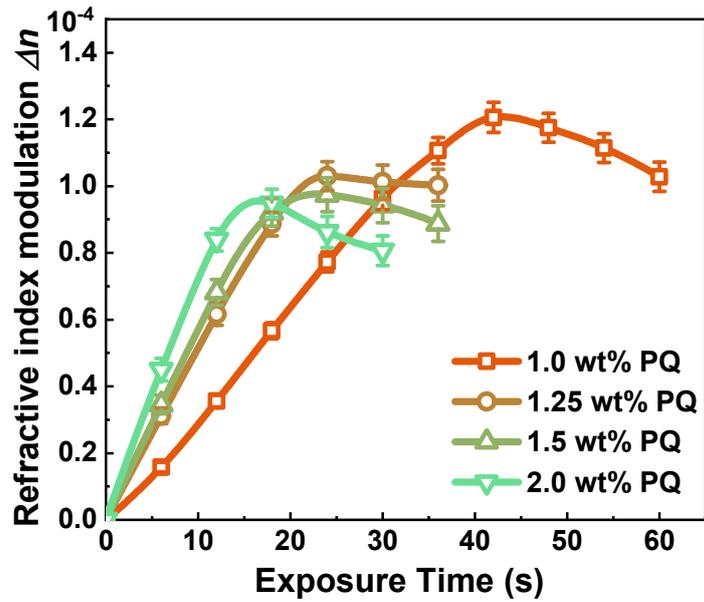


Figure S7. Exposure time-dependent refractive index modulation of NMP-PQ/PMMA(20wt%) with different PQ concentrations.

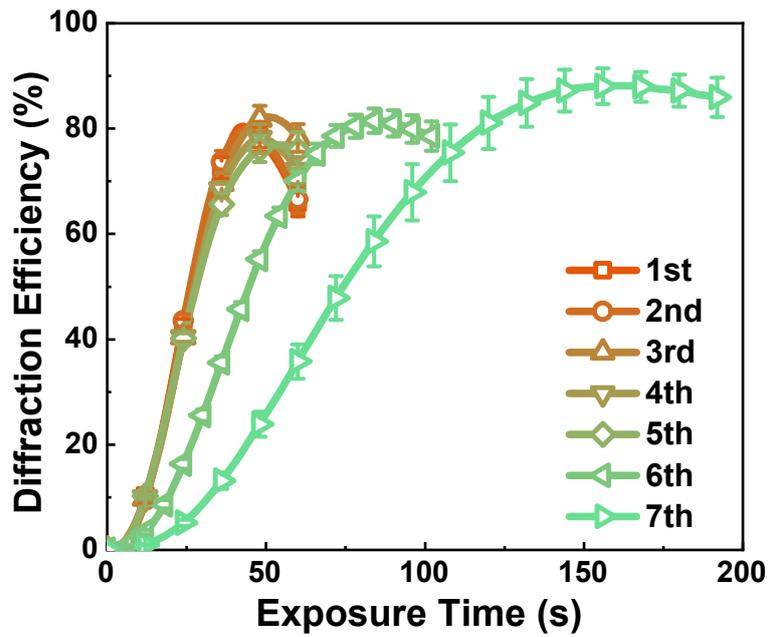


Figure S8. Exposure time-dependent diffraction efficiency of NMP-PQ/PMMA (20 wt%) with recorded in multiple replicates.

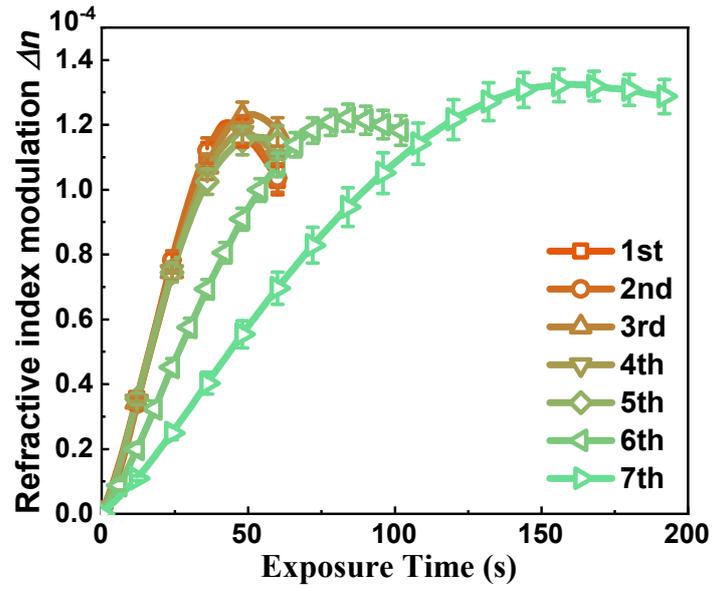


Figure S9. Exposure time-dependent refractive index modulation of NMP-PQ/PMMA (20 wt%) with recorded in multiple replicates.

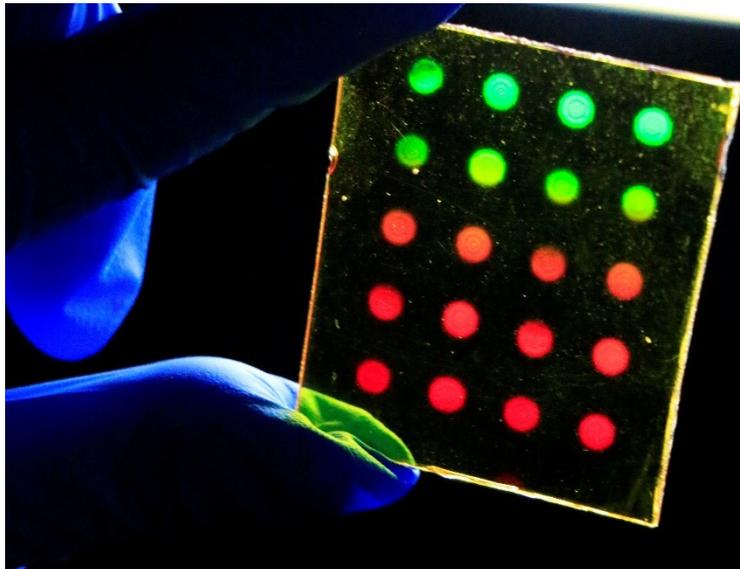


Figure S10. The gratings were recorded on a 1.5 mm thick NMP-PQ/PMMA photopolymer and the pattern diameter is 5 mm.

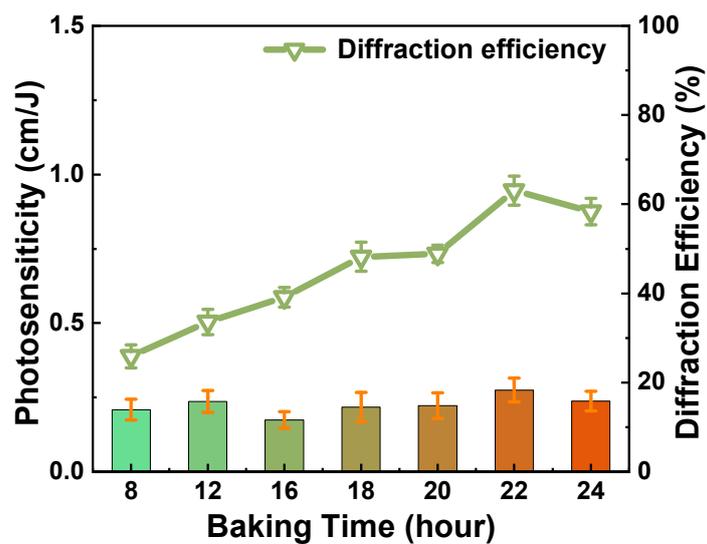


Figure S11. Photosensitivity and diffraction efficiency of PQ/PMMA with different baking times.

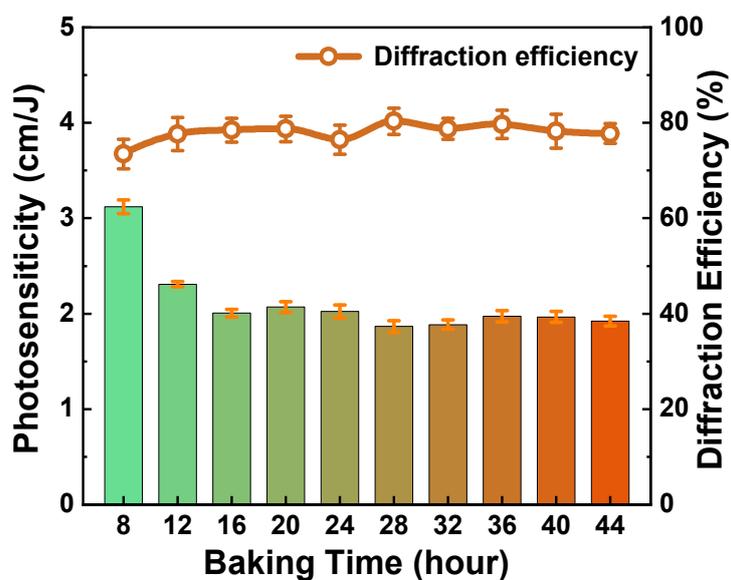


Figure S12. Photosensitivity and diffraction efficiency of NMP-PQ/PMMA(20 wt%) with different baking times.

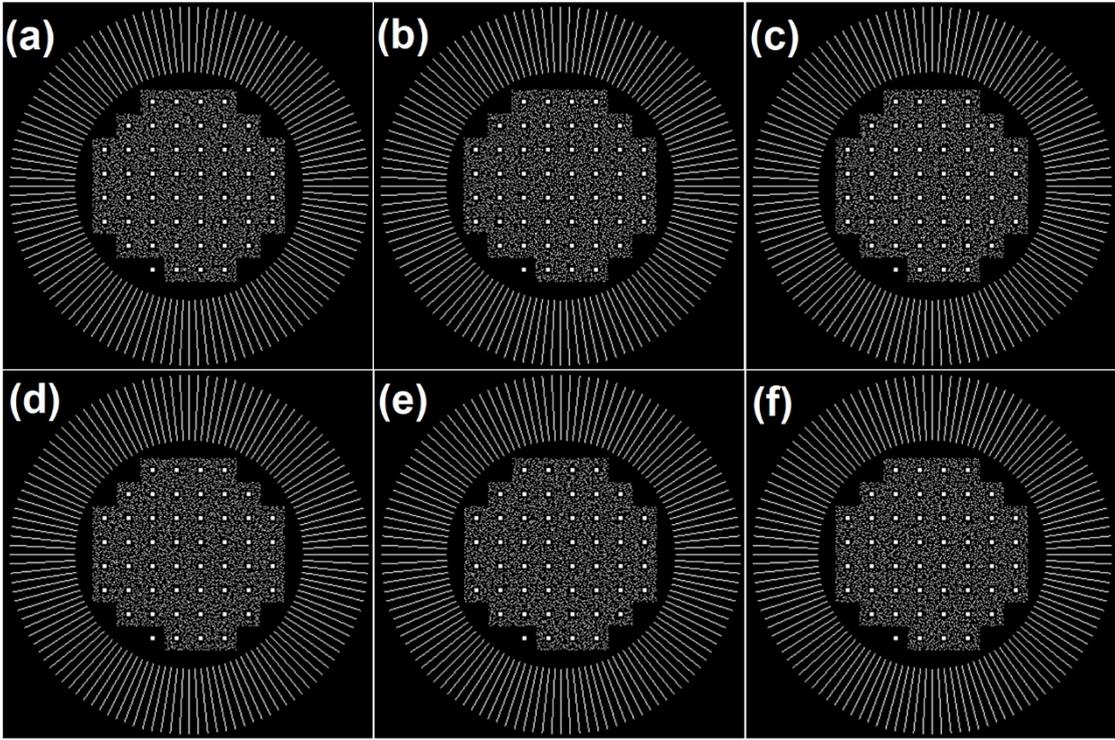


Figure S13. Collinear holographic storage system: (a)-(f) write process 2-D digital page-data images.