Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Anti-reflective UV and blue light of structurally colored contact lenses based on copolymer hydrogel with amorphous array nanostructures

Chun-Feng Lai*, Jia-Sian Li, Yu-Ting Fang, Chun-Jen Chien, and Chien-Huei Lee

*E-mail: chunflai@fcu.edu.tw

Figure S1. (a) Digital photographs and (b) transmittance of the commercial standard contact lens and commercial blue filter contact lens.

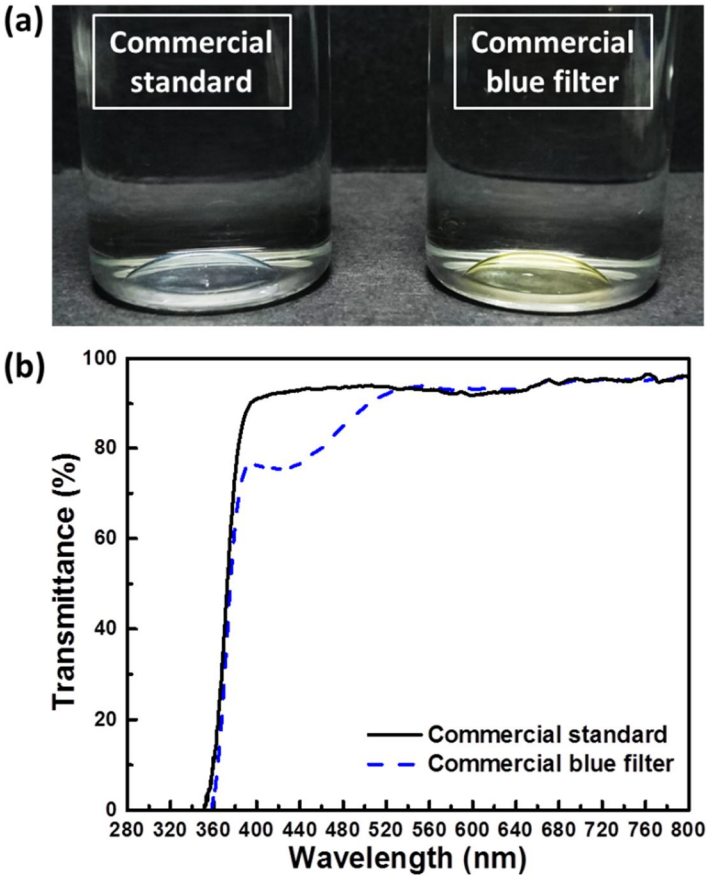


Table S1. Transmittance of commercial contact lenses.

Transmittance [%]	UV-B (280~315 nm)	UV-A (316~380 nm)	SWB (381-460 nm)	LWB (461~500 nm)	Visible (381~780 nm)
Commercial standard	0%	13.36%	91.13%	93.62%	93.31%
Commercial blue filter	0%	10.01%	76.01%	85.05%	89.51%

Figure S2. FESEM image and size distribution of silica nanospheres in this study.

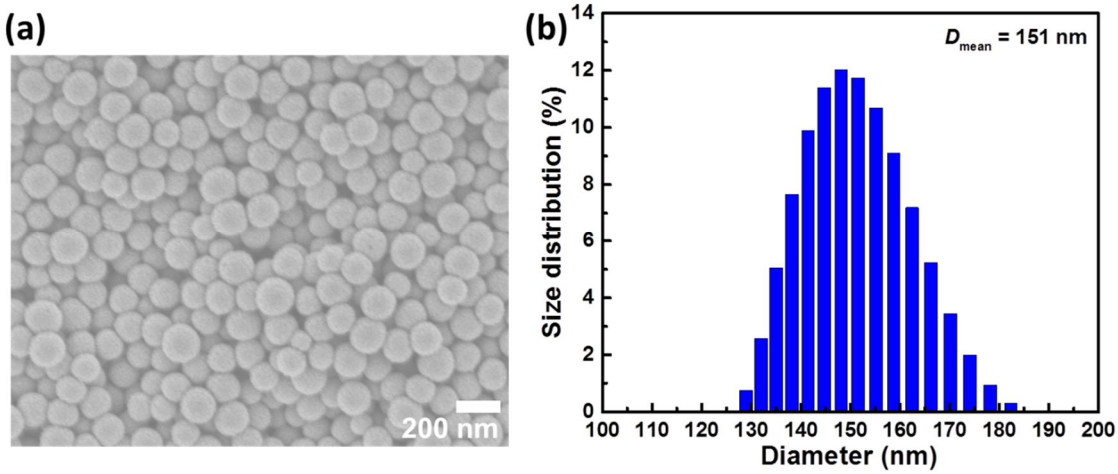


Table S2. Percent composition of all the contact lens samples.

Unit: wt%

Sample	HEMA	MMA	NVP	DMAA	EGDMA	HMPP	Silica nanospheres
Standard	81.0	1.0	5.0	10.0	1.0	2.0	-
Sample A	66.0	0.8	4.1	8.1	0.8	1.6	18.6
Sample B	53.6	0.7	3.3	6.6	0.7	1.3	33.8
Sample C	43.2	0.5	2.6	5.3	0.5	1.0	46.8

Figure S3. FT-IR spectrum demonstrated the characteristics of the produced contact lens samples with different ϕ_{silica} values of AAs.

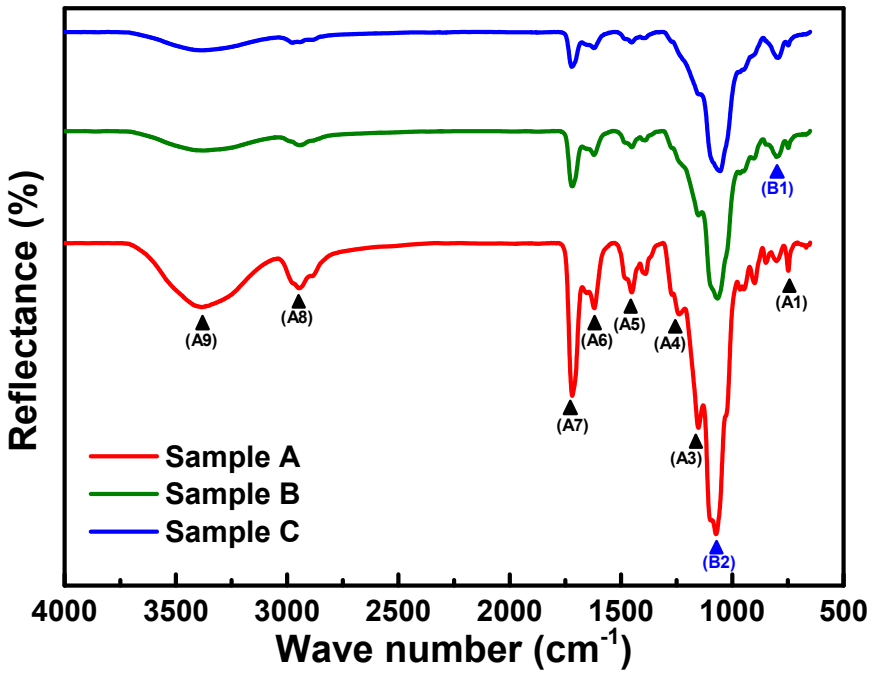
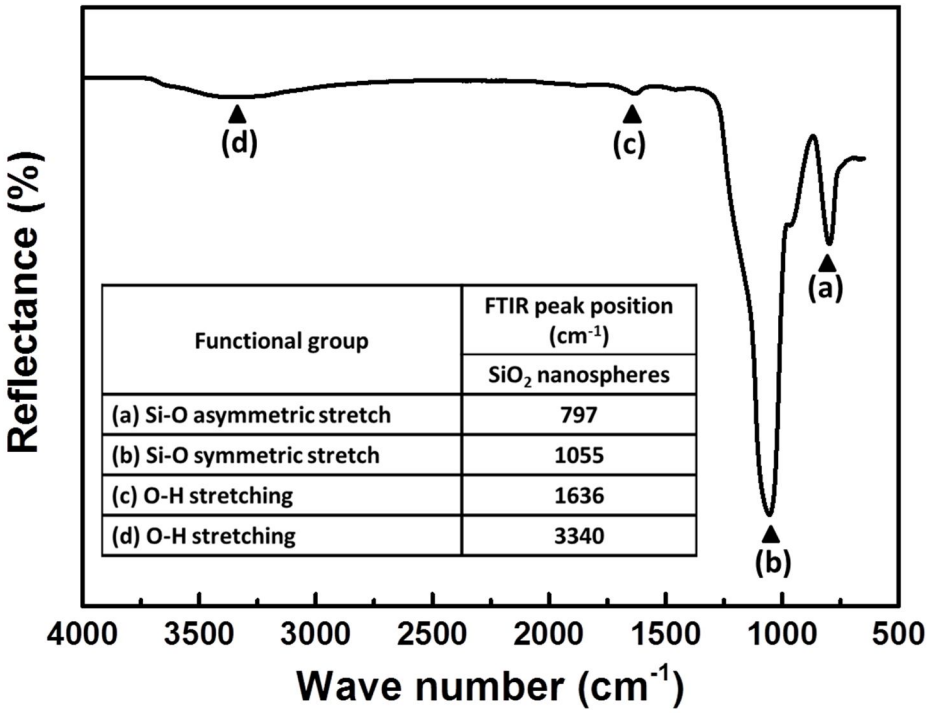


Figure S4. FT-IR spectrum demonstrated the characteristics of the silica nanospheres. Inset shows the spectrum band assignment of the silica nanospheres.



Functional group	FTIR peak position (cm^{-1})
	SiO_2 nanospheres
(a) Si-O asymmetric stretch	797
(b) Si-O symmetric stretch	1055
(c) O-H stretching	1636
(d) O-H stretching	3340

Figure S5. Reflection and transmittance of sample C (ϕ_{silica}=30%) before hydration. Inset shows the digital photograph of sample C.

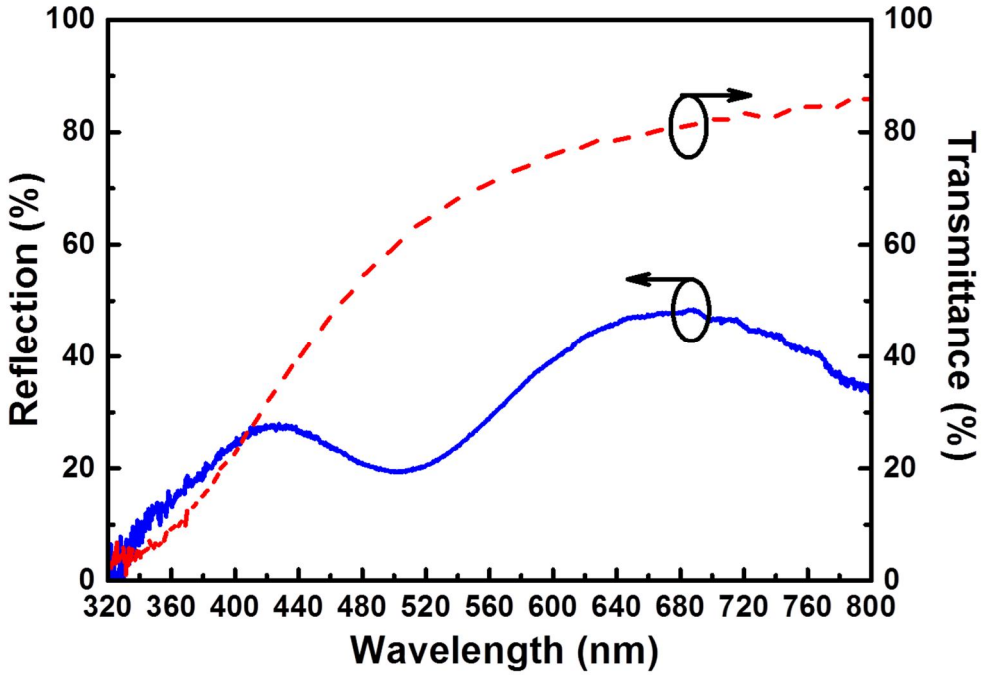


Figure S6. (a) Digital photographs and (b) transmittance spectra of all structurally colored contact lens samples were stored in DI water for 155 days.