sensors

Supporting Information

Fabrication of Polymer Optical Fibre (POF) Gratings

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Table S1. POF materials and their photosensitivity

Core	**Cladding**	**Dopant**	**POF**	**Source**	**Power**	**Time**	**Δn**	**Mechanism**	**Ref**
PMMA	-	-	-	325 nm UV laser	6 mW (focused)	-	3×10^{-3}	photoinduced cross linking	[1]
Poly(BzMA-co-MMA)	P(EMA-co-MMA)	fluorescein (170ppm)	two core SI	514 nm Ar^{+} laser	0.36-1.08 mW	62 mins	3.3×10^{-5}	-	[2]
Poly(BzMA-co-MMA)	P(EMA-co-MMA)	fluorescein (170ppm)	two core SI	OPO pulsed laser @ 248, 280, 325 nm	-	-	-	-	[2]
Poly(BzMA-co-MMA)	P(EMA-co-MMA)	Rhodamine 6G	MM SI	325 nm OPO pulsed laser	-	-	-	-	[3]
Poly(MMA-co-EMA-co-BzMA)	PMMA	-	SM SI	325 nm OPO pulsed laser	-	-	10^{-4}	photo cross-linking & photopolymerization	[4]
CYTOP	-	-	-	355 nm Nd:YAG laser	350 mJ	20 mins	3×10^{-4}	-	[5]
PMMA	-	azobenzene dye(800ppm)	MM SI	532nm Nd:YVO_4 laser	87mW/cm^2	60mins	3×10^{-5}	photo induced birefringence	[6-7]
Poly(MMA-co-EMA-co-BzMA)	PMMA	-	SM SI	325nm OPO pulsed laser	-	85 mins	1×10^{-3}	-	[8-10]
PMMA	-	-	-	800nm 40 fs Ti:sapphire	1 J/cm^2	-	5×10^{-4}	-	[11]
Poly(MMA-co-CAMA)	Poly(MMA-co-BA)	CAMA (3-4 wt%)	SI	532 nm Nd:YVO_4 laser	-	-	-	photo-induced birefringence	[12-15]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-BMA)	TSB (0.66wt%)	MM SI	325 nm laser	0.208 W/ cm^2	10 mins	-3×10^{-4}	photoisomerization	[16]
PMMA (doped DPS 0.5%)	PMMA	Photosol 7-049 (0.5%)	MM GI	501.7 nm Ar laser	4 mW	-	-	optical ring cleavage	[17]
Poly(MMA-co-EMA-co-BzMA)	PMMA	-	SM SI	325 nm OPO laser	4.5 mJ	450 mins	2.6×10^{-4}	-	[18]
Poly(MMA-co-MVK-co-BzMA)	PMMA	MVK (8wt%)	FM SI	UV mercury lamp	0.3 mW/cm^2	200 s	6×10^{-3} (10 wt%)	photodegradation	[19]

Core	**Cladding**	**Dopant**	**POF**	**Source**	**Power**	**Time**	**Δn**	**Mechanism**	**Ref**
PMMA	-	-	FM & SM mPOF	325 nm He-Cd laser		60 mins	-	-	[20]
Poly(BzMA-co-MMA)	P(EMA-co-MMA)	-	SI	325 nm He-Cd laser	30 mW	-	-	-	[21-22]
PMMA	-	-	SM SI	387 nm Ti: sapphire fs laser	0.8J/cm^2	-	2×10^{-3}	polymer backbone cleavage & monomer production	[23-25]
Poly(MMA-co-CAMA)	Poly(MMA-co-BA)	CAMA (3.2 wt%)	SI	421.8 nm He-Cd laser	-	-	-	photoinduced birefringence	[26-27]
PMMA	-	-	MM & SM SI	400 nm fs laser	80-100nJ	-	-	index change via 2-photon absorption	[28]
PMMA-co-PS (5% PS)	PMMA	-	SM SI	308 nm XeCl excimer laser	85 mJ/cm^2	60 mins	-	-	[29]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA–EMA)	-	SM SI	308 nm XeCl excimer laser	70 mJ/cm^2	17 mins	-	-	[29]
PMMA	-	-	POF	800 nm fs laser	60 nJ	-	-	refractive index modifications	[30]
PMMA	-	-	mPOF	325 nm He-Cd laser	30 mW	-	-		[31-32]
PMMA	-	-	-	387 nm fs laser	0.446 J/cm^2	-	5×10^{-5}	depolymerization and crosslinking	[33]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-EMA)	BDK (2wt%)	MM &SM SI	355 nm Nd:YAG	0.673 W/cm^2	16 mins	4.5×10^{-5}	polymerization photolock & photodegradation	[34]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-BMA)	TSB (1wt%)	MM SI	325 nm laser	-	15 mins	1.5×10^{-5}	photoisomerization	[35]
PMMA	-	-	MM mPOF	325 nm He-Cd laser	30 mW	-	-	-	[36-38]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-BMA)	TSB (1wt%)	MM SI	325 nm laser	-	-	-	photoisomerization	[39]

Core	**Cladding**	**Dopant**	**POF**	**Source**	**Power**	**Time**	**Δn**	**Mechanism**	**Ref**
COC	-	-	FM mPOF	325 nm He-Cd laser	30 mW	30-40 mins	-	-	[40]
COC	-	-	SM mPOF	325 nm He-Cd laser	30 mW	-	-	-	[41]
COC	-	-	mPOF	325 nm He-Cd laser	5 W/cm^2	300 mins	-	-	[42]
PMMA	-	-	FM mPOF	325 nm He-Cd laser	-	185 mins	-	-	[43]
PMMA-co-PS (5% PS)	PMMA	-	FM SI	325 nm He-Cd laser		60 mins	-	-	[43]
COC	-	-	mPOF	325 nm He-Cd laser	5 W/cm^2	338 mins	1.5×10^{-5}		[44]
Poly(MMA-co-BA-co-VA)	Poly(MMA-co-BA)	VA (0.2 mol%)	FM SI	355 nm laser	10 mW	-	8.0×10^{-4}	photo-crosslinking	[45-46]
PMMA	-	BDK	mPOF	325 nm He-Cd laser	2.65 W/cm^2	13 mins	3.2×10^{-4}	polymerization, photolock, & photodegradation	[47]
COC	-	-	-	248 nm KrF excimer laser	-	30 s	-	-	[48]
COC	-	-	-	248 nm KrF excimer laser	-	8 s	-	-	[48]
PMMA	-	-	mPOF	800 nm fs laser	-	2.5 s	-		[49-50]
PMMA	-	-	mPOF	325 nm He-Cd laser	-	-	-		[51]
PMMA	-	-	-	325 nm He-Cd laser	-	-	-	-	[52]
CYTOP	PMMA	-	MM GI	355 nm Nd:YAG laser	-	-	-	-	[53]
PMMA-co-PS (5% PS)	PMMA	-	SM SI	248 nm laser	0.5 mJ/cm^2	-	-		[54]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-EMA)	-	micro POF	325 nm He-Cd laser	50 mW	3 mins	-		[55]

Core	**Cladding**	**Dopant**	**POF**	**Source**	**Power**	**Time**	**Δn**	**Mechanism**	**Ref**
PMMA	-	-	SM POF	325 nm He-Cd laser	30 mW	-	-		[56]
PMMA	-	-	SM mPOF	325 nm He-Cd laser	30 mW	-	-		[57-59]
PMMA-co-PS (5% PS)	PMMA	-	SM SI POF	325 nm He-Cd laser	30 mW	-	-		[57-59]
PMMA	-	-	SM mPOF	325 nm He-Cd laser	30 mW	-	-		[57-59]
PMMA-co-PS (5% PS)	PMMA	-	SM SI POF	325 nm He-Cd laser	30 mW	-	-		[57-59]
PMMA	-	-	SM & MM mPOF	325 nm He-Cd laser	30 mW	-	-		[57-59]
PMMA	-	-	mPOF	325 nm He-Cd laser	30 mW	7 mins	-	-	[60-61]
CYTOP	?	-	MM GI	248 nm KrF excimer laser	5k J/cm^2	-	-	-	[62]
PMMA	-	-	mPOF	325 nm He-Cd laser	900 kW/m^2	-	8.5×10^{-3}	Photodegradation & further polymerization	[63-64]
PMMA	-	TSB	mPOF	325 nm He-Cd laser	30 mW	42 s	-	photoblation due to high absorption	[65]
PMMA(doped DPS 5 mol%)	PMMA	TSB (1wt%)	SI POF	325 nm He-Cd laser	-	-	-	photoisomerization	[66]
PMMA(doped DPS 5 mol%)	PMMA	TSB (1wt%)	SI POF	325 nm He-Cd laser	-	-	-	photoisomerization	[67]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-EMA)	-	SM SI	325 nm He-Cd laser	50 mW	-	-		[68]
CYTOP	PMMA	-	MM GI	325 nm He-Cd laser	30 mW	12 mins	-		[69]
PMMA	-	-	SM mPOF	325 nm He-Cd laser	30 mW	50 mins	-		[69]

Core	Cladding	Dopant	POF	Source	Power	Time	Δn	Mechanism	Ref
PC	-	-	SM mPOF	325 nm He-Cd laser	50 mW	-	-	-	[70]
CYTOP	PE/PC	-	MM GI	517 nm fs laser	~80 nJ/pulse	-	1.3×10^{-4}	-	[71-72]
COC (TOPAS 5013S-04)	COC (ZEONEX 480R)	-	SM SI	325 nm He-Cd laser	-	-	-	-	[73]
PC	-	-	SM mPOF	325 nm He-Cd laser	4 mW	~6 mins	-	-	[74]
PMMA	-	-	SM mPOF	325 nm He-Cd laser	30 mW	15 mins		-	[75-76]
PMMA	-	-	SM mPOF	325 nm He-Cd laser	20 mW	-	-		[77]
PMMA	-	-	FM mPOF	248 nm laser	33 mJ/cm^2	30 s	2.4×10^{-4}		[78]
PMMA	-	-	D-shape SM SI	325 nm He-Cd laser	-	-	-		[79]
PMMA	-	azobenzene	mPOF	325 nm He-Cd laser	30 mW	42 s	-	photoblation due to high absorption	[80]
PMMA (doped DPS 5mol%)	PMMA	TSB (1wt%)	SI	800 nm fs laser	20 mW	70 s	-	index change via 2-photon absorption	[81]
COC (TOPAS 5013S-04)	COC (ZEONEX 480R)	-	SM SI	325 nm He-Cd laser	6 mW	4 mins			[82]
PMMA	-	-	HiBi mPOF	248 nm KrF laser	33 mJ/cm^2		-		[83]
Poly(MMA-co-EMA-co-BzMA)	Poly(MMA-co-EMA)	-	micro POF	325 nm He-Cd laser	50 mW	7 s			[84]

Note: CAMA: 2-{4-[2-(4-cyano-phenyl)-diazenyl]–phenyloxy}-ethyl methacrylate

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