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Vinyl ethers and epoxides photoinduced copolymerization with perfluoropolyalkylether monomers / Trusiano, G.; Vitale, A.; Bonneaud, C.; Pugliese, D.; Dalle Vacche, S.; Joly-Duhamel, C.; Friesen, C. M.; Bongiovanni, R.. - In: COLLOID AND POLYMER SCIENCE. - ISSN 0303-402X. - 299:(2021), pp. 509-521. [10.1007/s00396-020-04723-3]

Availability:

This version is available at: 11696/77369 since:

Publisher:

Springer

Published

DOI:10.1007/s00396-020-04723-3

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Supporting Information

Vinyl ethers and epoxides photoinduced copolymerization with perfluoropolyalkylether monomers

Giuseppe Trusiano,^{†,} Alessandra Vitale,^{†,*} Céline Bonneaud,[‡] Diego Pugliese,[†] Sara Dalle Vacche[†],
Christine Joly-Duhamel,[‡] Chadron M. Friesen,[§] Roberta Bongiovanni[†]*

[†] Department of Applied Science and Technology , Politecnico di Torino, Corso Duca degli Abruzzi 24,
10129 Torino, Italy

[‡] Institut Charles Gerhardt Montpellier , University of Montpellier, CNRS, ENSCM, Cedex 5,
34296 Montpellier, France

[§] Department of Chemistry, Trinity Western University, 7600 Glover Road, V2Y 1Y1 Langley, BC, Canada

* Corresponding authors: giuseppe.trusiano@polito.it ; alessandra.vitale@polito.it

List of Figures

Fig. S1 ATR FT-IR spectra of the PFPAE-EGVE + TVE copolymer:.....	3
Fig. S2 ATR FT-IR spectra of the PFPAE-BGVE + TVE copolymer:	3
Fig. S3 ATR FT-IR spectra of the PFPAE-DEGVE + TVE copolymer:	4
Fig. S4 ATR FT-IR spectra of the PFPAE-MO + TGE copolymer:	4
Fig. S5 ATR FT-IR spectra of the PFPAE-EO + TGE copolymer:	5
Fig. S6 ATR FT-IR spectra of the PFPAE-PO + TGE copolymer:	5
Fig. S7 Water contact angle hysteresis measurements, on air and glass sides, of the UV-cured copolymers: ...	7

List of Tables

Table S1 Number of repeat units, average molecular weight (M_n), difunctional content, (from ^{19}F -NMR spectra) of the functionalized PFPAE monomers, and composition details and fluorine content of the investigated copolymers.	6
Table S2 Degradation temperatures of the UV-cured hydrogenated resins and copolymers.....	7

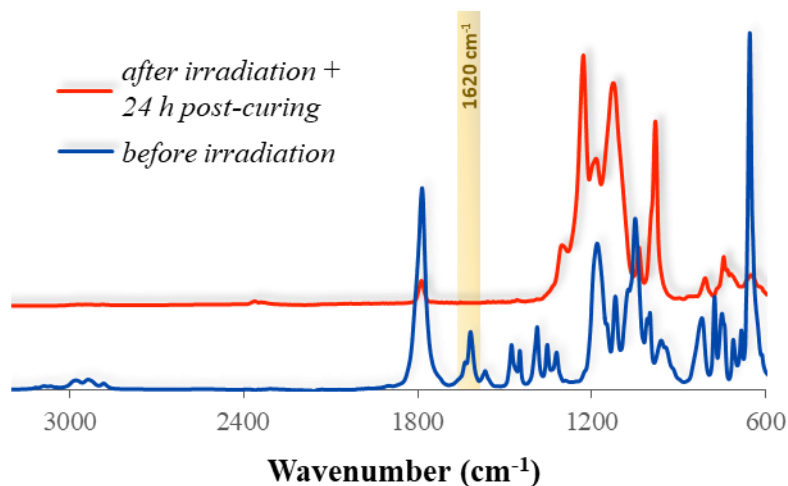


Fig. S1 ATR FT-IR spectra of the PFPAE-EGVE + TVE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

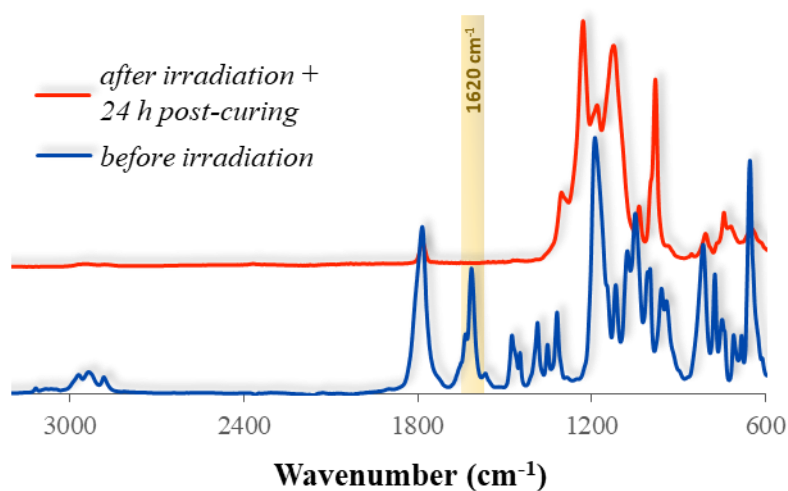


Fig. S2 ATR FT-IR spectra of the PFPAE-BGVE + TVE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

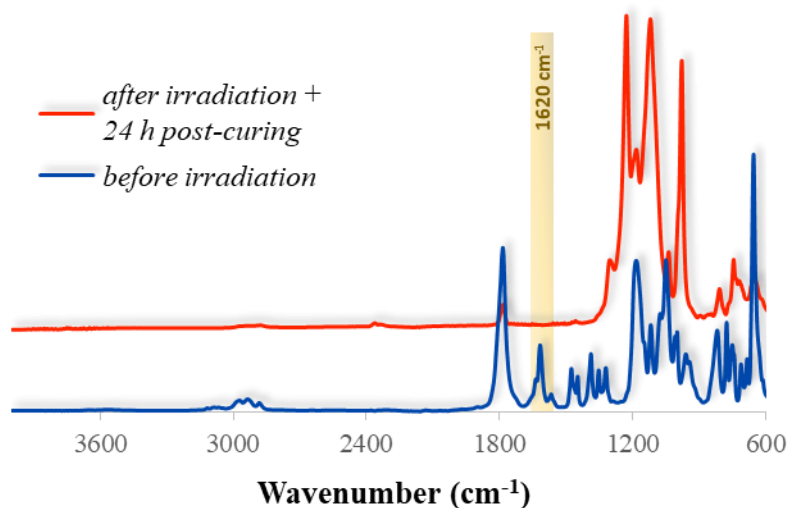


Fig. S3 ATR FT-IR spectra of the PFPAE-DEGVE + TVE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

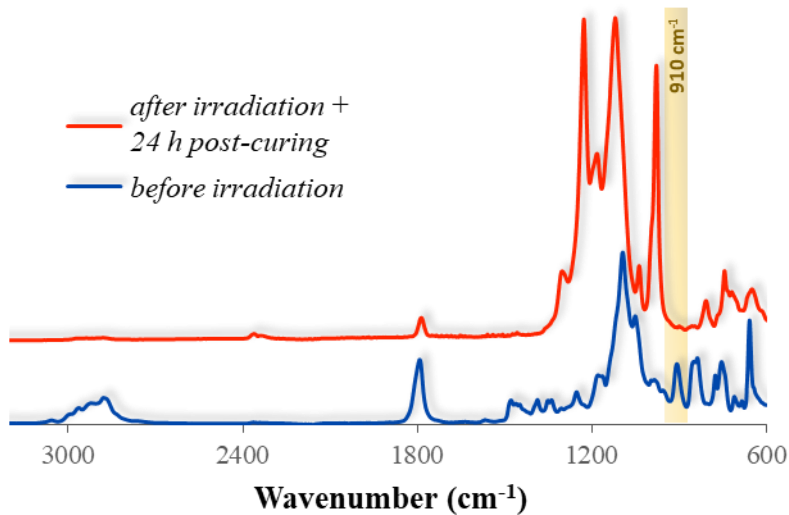


Fig. S4 ATR FT-IR spectra of the PFPAE-MO + TGE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers; peak $\sim 910\text{ cm}^{-1}$ epoxides;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

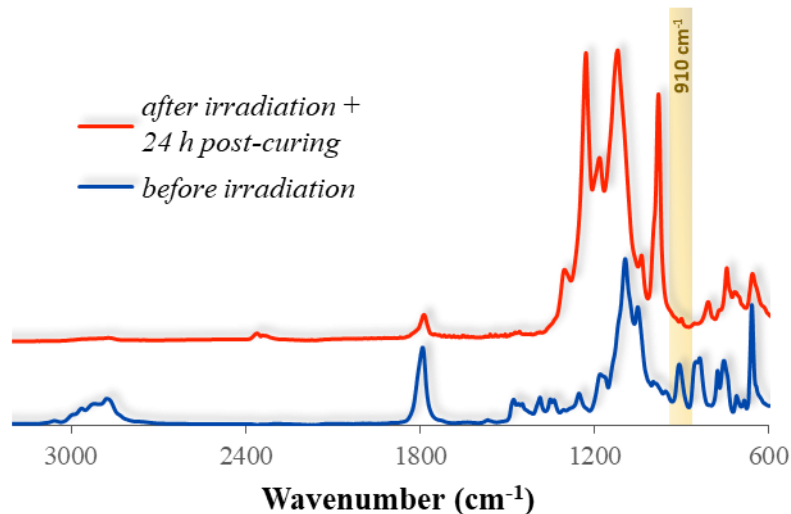


Fig. S5 ATR FT-IR spectra of the PFP AE-EO + TGE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers; peak $\sim 910\text{ cm}^{-1}$ epoxides;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

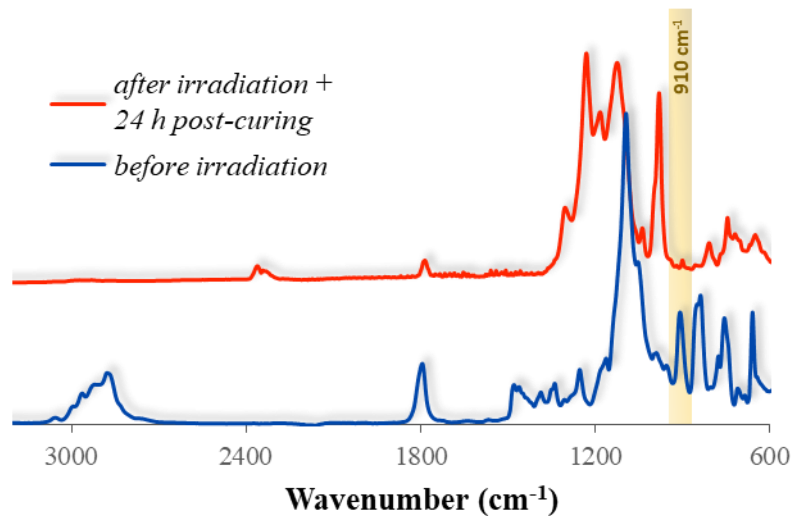


Fig. S6 ATR FT-IR spectra of the PFP AE-PO + TGE copolymer:

R_h: peak $\sim 1780\text{ cm}^{-1}$ C=O bond; $\sim 1620\text{ cm}^{-1}$ C=C; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers; peak $\sim 910\text{ cm}^{-1}$ epoxides;

R_f: peak $\sim 1240\text{ cm}^{-1}$ stretching C-F bond, and peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers;

Photoinitiator: peak $\sim 2950\text{ cm}^{-1}$ stretching C=C-H; peak $\sim 1780\text{ cm}^{-1}$ C=O bond; peak $\sim 1600\text{-}1320\text{ cm}^{-1}$ C₆H₆ bonds; peak $\sim 1100\text{ cm}^{-1}$ C-O-C ethers

Table S1 Number of repeat units, average molecular weight (M_n), difunctional content, (from ^{19}F -NMR spectra) of the functionalized PFPAE monomers, and composition details and fluorine content of the investigated copolymers.

Copolymer	m	PFPAE molecular weight (g/mol)	PFPAE difunctional content (mol%)	PFPAE/Resin weight ratio	F content in copolymer (wt%)	F content in copolymer (mol%)
PFPAE-EGVE + TVE	6	1740	56	0.32	18.45	0.97
PFPAE-BGVE + TVE	8	2130	88	0.32	18.93	1.00
PFPAE-DEGVE + TVE	7	2000	43	0.32	16.46	0.87
PFPAE-MO + TGE	12	2720	63	0.32	17.06	0.90
PFPAE-EO + TGE	8	2130	41	0.32	16.06	0.85
PFPAE-PO + TGE	10	2530	58	0.32	16.08	0.85

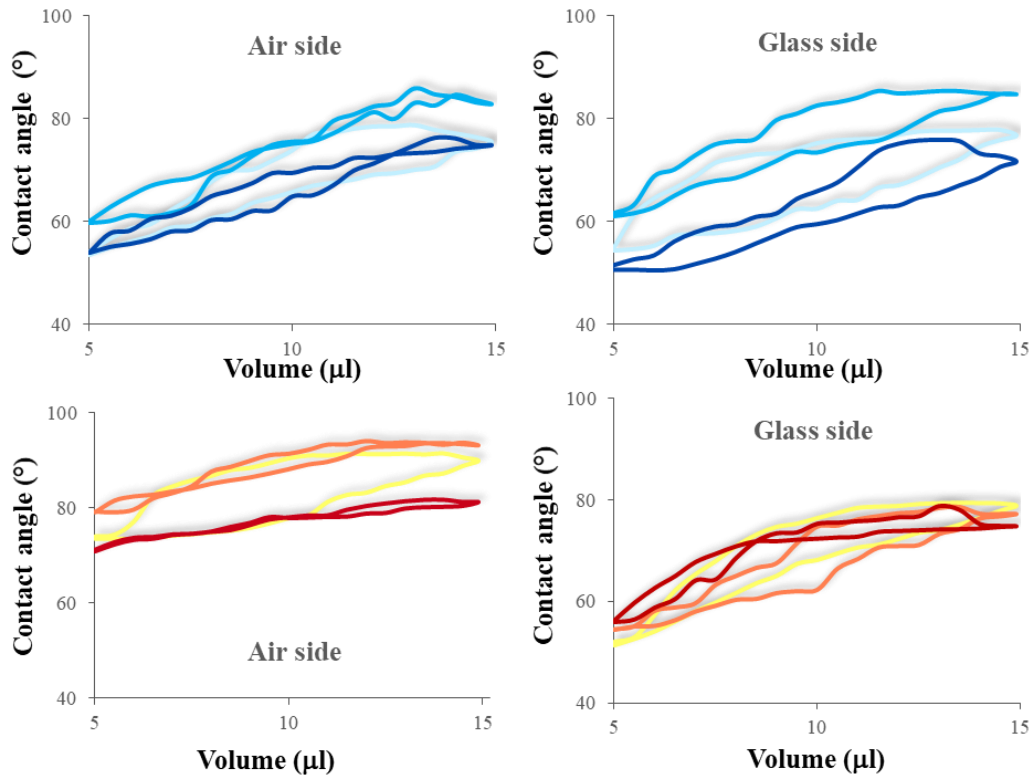


Fig. S7 Water contact angle hysteresis measurements, on air and glass sides, of the UV-cured copolymers:

— PFPAE-EGVE + TVE, — PFPAE-BGVE + TVE, — PFPAE-DEGVE + TVE,
 — PFPAE-MO + TGE, — PFPAE-EO + TGE, — PFPAE-PO + TGE.

Table S2 Degradation temperatures of the UV-cured hydrogenated resins and copolymers

System	T _{onset} (°C)	T _{max1} (°C)	T _{max2} (°C)	T _{90%} (°C)
TVE	188	-	398	428
PFPAE-EGVE + TVE	137	181	397	427
PFPAE-BGVE + TVE	150	192	366	429
PFPAE-DEGVE + TVE	136	182	375	429
TGE	185	-	378	405
PFPAE-MO + TGE	130	156	381	413
PFPAE-EO + TGE	132	159	361	410
PFPAE-PO + TGE	140	159	385	413