Study on Press Formability and Properties of UV-curable Polyurethane Acrylate Coatings with Different Reactive Diluents

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Supporting Information

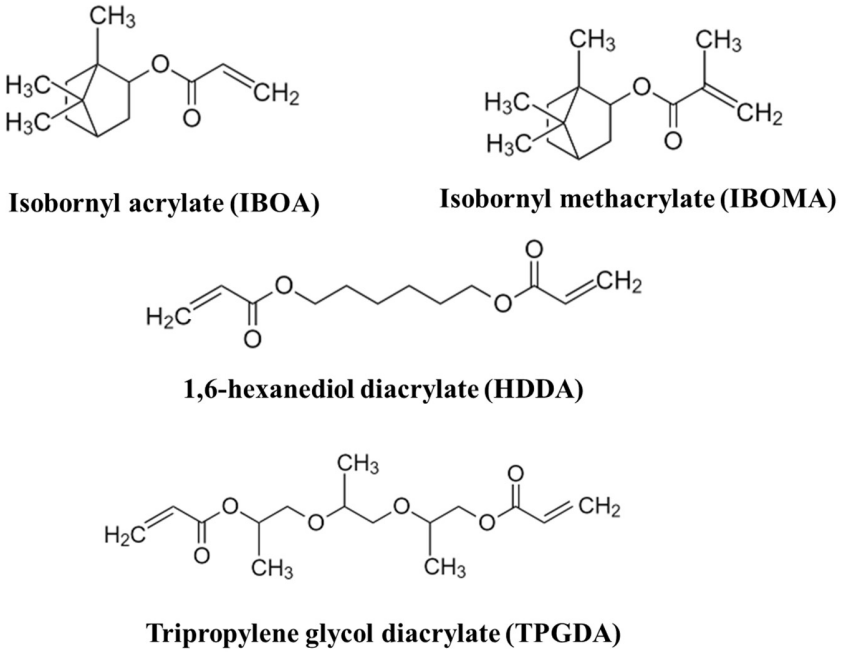


Figure S1. Structures of the reactive diluents used in this study.

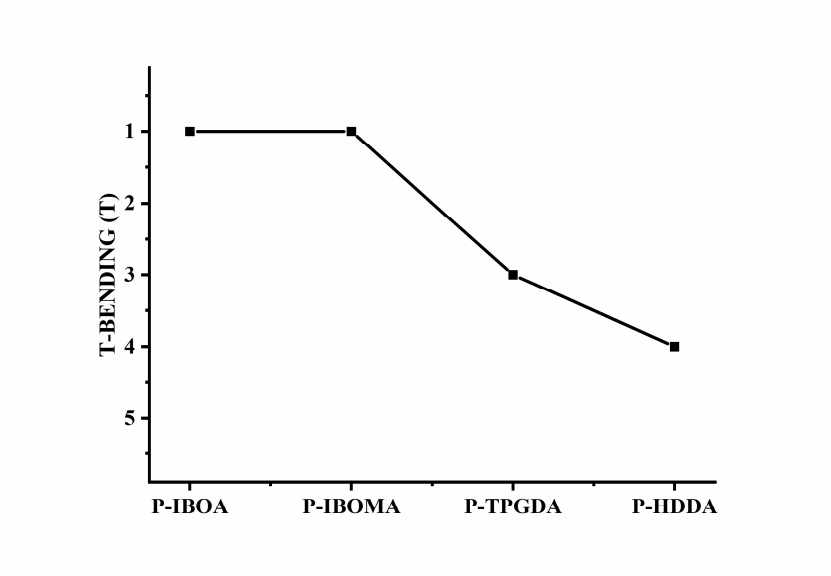


Figure S2. T-bending test on UV-cured PUA coating films.

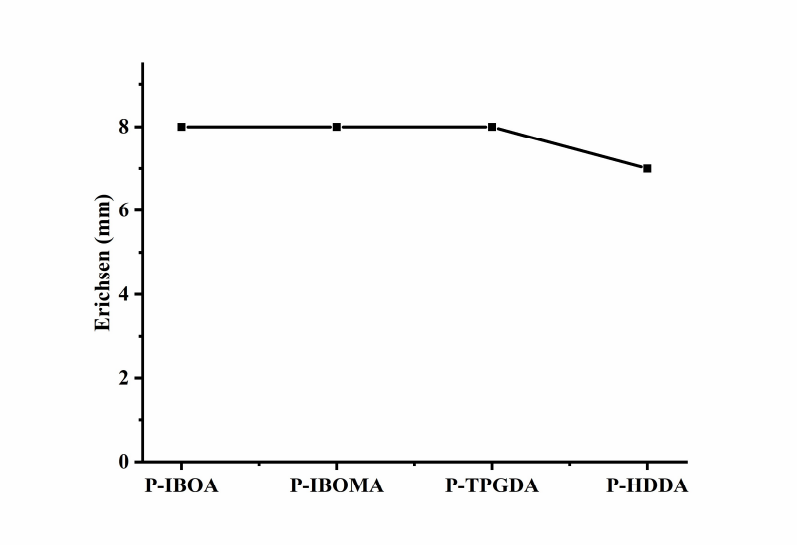


Figure S3. 0~8 mm Erichsen test on UV-cured PUA coating films.

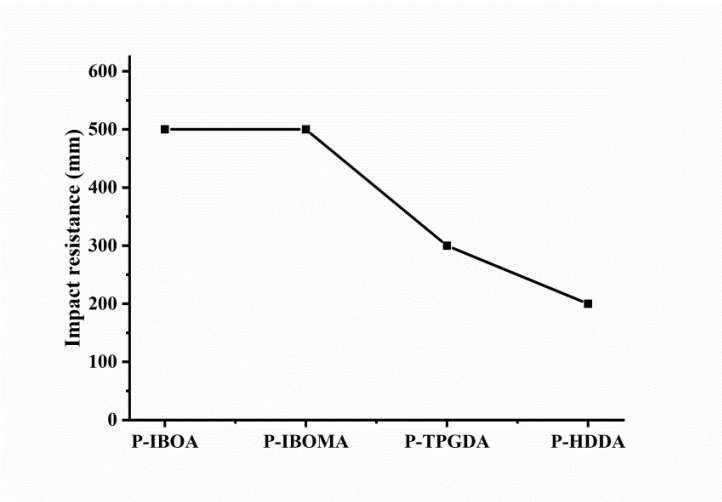


Figure S4. 0~500 mm impact resistance test on UV-cured PUA coating films.

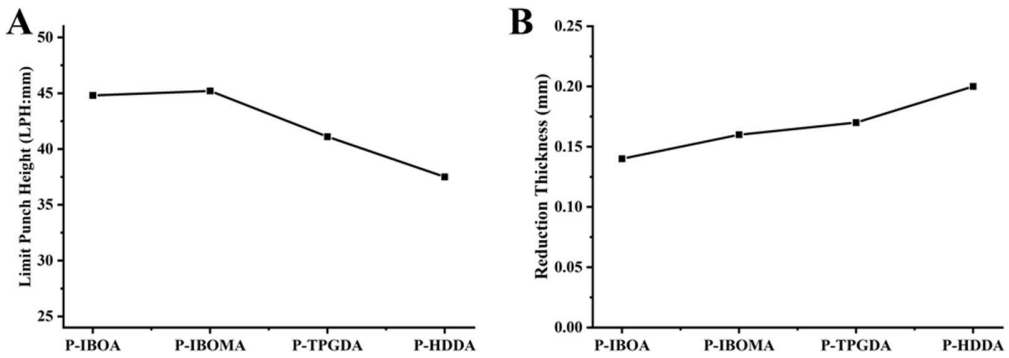


Figure S5. A) LPH test and B) reduction thickness test on UV-cured PUA coating films.

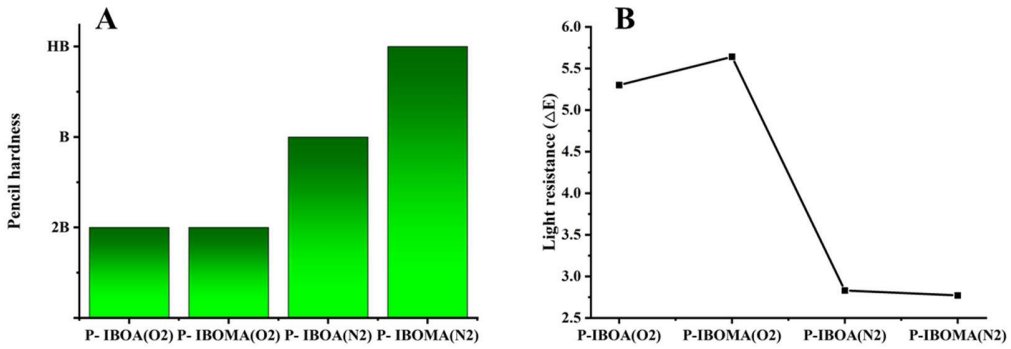


Figure S6. A) Pencil hardness test and B) UV-light resistance test on UV-cured PUA coating films in the N_2 atmosphere.

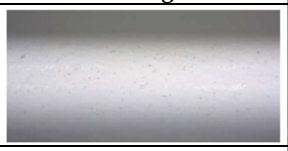
	T-bending (1T)	8 mm Erichsen	500 mm Impact
P-IBOA(N_2)			
Result	GOOD	GOOD	GOOD
	T-bending (1T)	8 mm Erichsen	500 mm Impact
P-IBOMA(N_2)			
Result	GOOD	GOOD	GOOD

Figure S7. T-bending, Erichsen test and impact resistance images of UV-cured PUA coated films in the N_2 atmosphere.

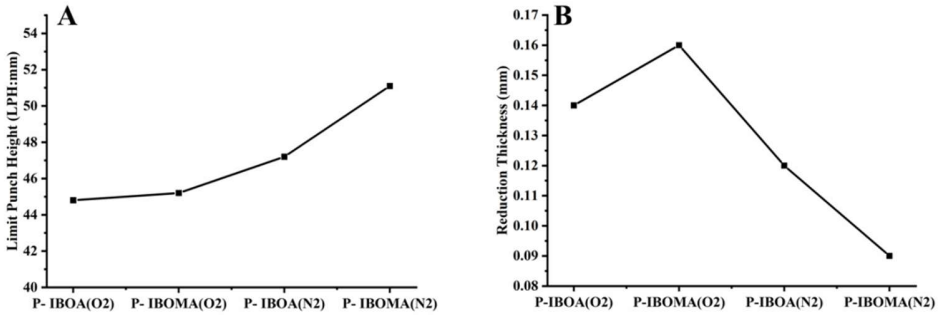


Figure S8. A) LPH test and B) reduction thickness test on UV-cured PUA coating films in the N_2 atmosphere.

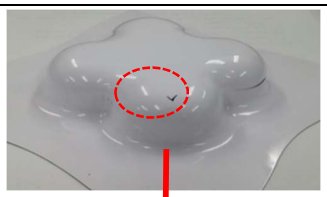
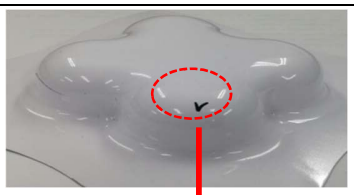
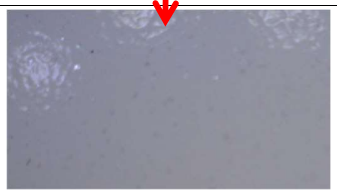
	P-IBOA(N_2)	P-IBOMA(N_2)
		
Compression and tension area		
Result	GOOD	GOOD

Figure S9. Formability test: Compression and tension area images of UV-cured PUA coating films in the N_2 atmosphere.

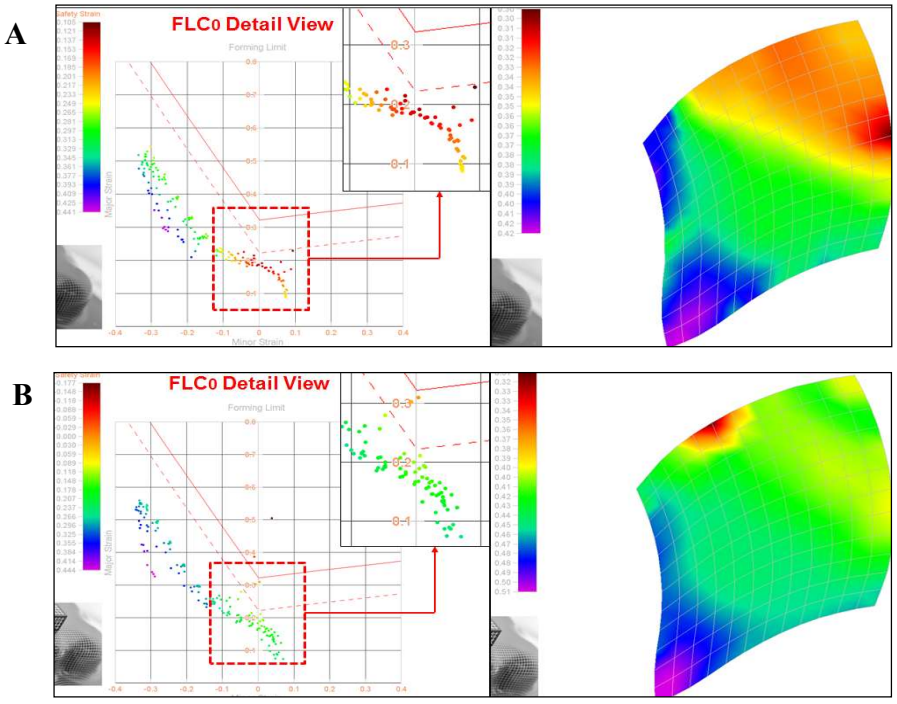


Figure S10. ASAME strain signatures of UV-cured PUA coating films A) P-IBOA and B) P-IBOMA in the N_2 atmosphere.

Table S1. Viscosities of the UV-curable PUA coatings

Oligomer	P-IBOA	P-IBOMA	P-TPGDA	P-HDDA
25500 cps	1080 cps	1120 cps	767 cps	426 cps

Table S2. Gel content (wt%) of the UV-cured PUA coating films

P-IBOA (0_2)	P-IBOMA (0_2)	P-TPGDA (0_2)	P-HDDA (0_2)	P-IBOA (N_2)	P-IBOMA (N_2)
95.8	95.5	96.5	96.9	99.3	99.5

Table S3. LPH and reduction thickness by Cross-die cup drawing in N2 atmosphere

No	Sample	Coating System			LPH (mm)	Reduction thickness (mm)
		Reactive diluent functionality	Thickness	Condition		
1	P-IBOA	1	30 μm	N_2	47.2	0.52~0.64
2	P-IBOMA	1	30 μm	N_2	51.1	0.52~0.61