

UV-Curable Coatings from Multi-Armed Cardanol-Based Acrylate Oligomers

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 (From the left to the right: ASBO, A-Gly-3, A-Xyl-4, A-TGly-5, A-Suc-6)

Table S1. Acid numbers, epoxy equivalent weights, and iodine values of multi-armed cardanol-based acrylate oligomers and their intermediates

Oligomer ^a	Theoretical acid number	Measured acid number	Epoxy equivalent weight (g/eq)	Epoxy value	Iodine value
Polyacid-3	282	288			
U-Gly-3		2.3		0.020	101
E-Gly-3			395	0.253	19
A-Gly-3		5.0		0.031	
Polyacid-4	260	268			
U-Xyl-4		2.1		0.024	99
E-Xyl-4			392	0.255	14
A-Xyl-4		5.0		0.015	
Polyacid-5	259	258			
U-TGly-5		1.8		0.018	98
E-TGly-5			413	0.242	15
A-TGly-5		4.7		0.032	
Polyacid-6	215	223			
U-Suc-6		4.7		0.015	95
E-Suc-6			442	0.226	16
A-Suc-6		4.2	5600	0.018	

^a The oligomers were named after their functionality, core and number of arms, e.g. A-Gly-3 was three-armed acrylate oligomer with a glycerol core, U-Suc-6 was six armed unsaturated oligomer with a sucrose core.

Table S2. Characteristic chemical shifts of protons for representative cardanol-based acrylate and its intermediates

Compound	Chemical shift (ppm)	Group assignment
Three-armed polyacid from glycerol	5.2-5.3	H of <i>CH</i> in glycerol residue
	4.0-4.4	H of <i>CH</i> ₂ in glycerol residue
	3.0-3.2	H on carbon attached to carboxylic acid in cyclohexane residue
	2.5-2.7	H on carbon attached to carboxylic acid in cyclohexane residue
	1.0-2.4	H of <i>CH</i> ₂ and <i>CH</i> in cyclohexane residue
	0.8-0.9	H of <i>CH</i> ₃ in cyclohexane residue
U-Gly-3	7.1-7.2, 6.7-6.9	aromatic H in cardanol residue
	5.7-5.9, 5.3-5.5, 4.9-5.1	H of <i>CH=CH</i> in the side chain of cardanol residue
	3.9-4.4	H of <i>-O-CH</i> ₂ - <i>CH(OH)-CH</i> ₂ - <i>O-</i> in the ring-opening product of glycidyl group
	2.8-2.9	H of <i>CH</i> ₂ in <i>-CH=CH-CH</i> ₂ - <i>CH=CH-</i> group
	2.5-2.7	H of benzyl <i>CH</i> ₂ in cardanol residue
	1.9-2.1	H of <i>CH</i> ₂ in <i>-CH</i> ₂ - <i>CH=CH-</i> group
	1.55-1.65	H of <i>CH</i> ₂ attached to benzyl carbon
	1.2-1.4	H of <i>CH</i> ₂ in the side chain of cardanol residue
	0.8-1.1	H of <i>CH</i> ₃ in the side chain of cardanol residue
E-Gly-3	2.8-3.2	H of <i>CH</i> in internal epoxy group
	1.45-1.55	H of <i>CH</i> ₂ adjacent to epoxy group
A-Gly-3	6.4-6.5, 6.1-6.2, 5.8-5.9	H of <i>CH</i> ₂ = <i>CH</i> in acrylate group

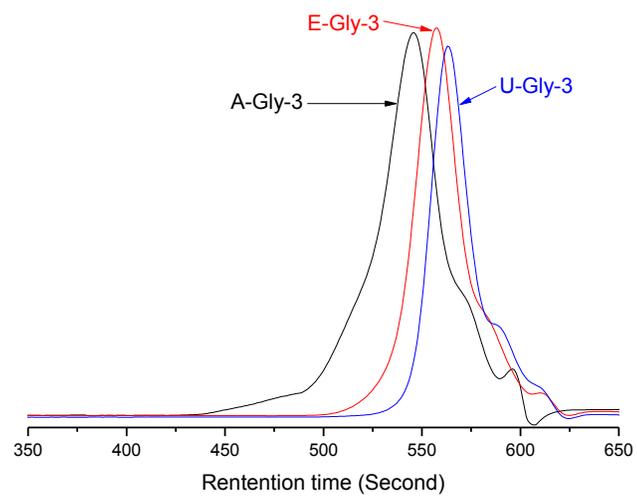


Figure S1. GPC traces for A-Gly-3 and its intermediates

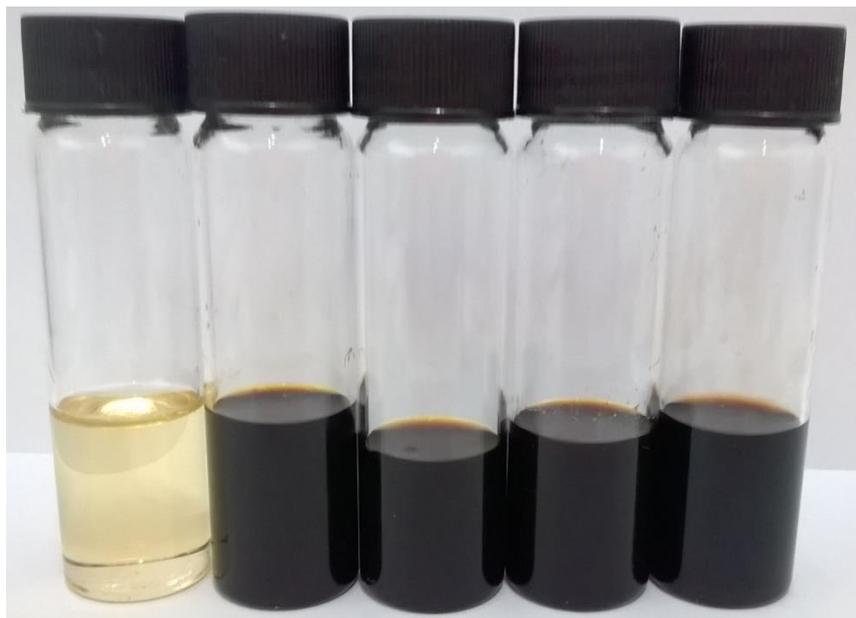


Figure S2. Images of cardanol-based acrylates and acrylated epoxidized soybean oil (ASBO)
(From the left to the right: ASBO, A-Gly-3, A-Xyl-4, A-TGly-5, A-Suc-6)