

Figure S1. Viscosity of benzoxazine with respect to shear rate



Figure S2. Thin Layer Chromatography of Benzoxazine compared to Cardanol

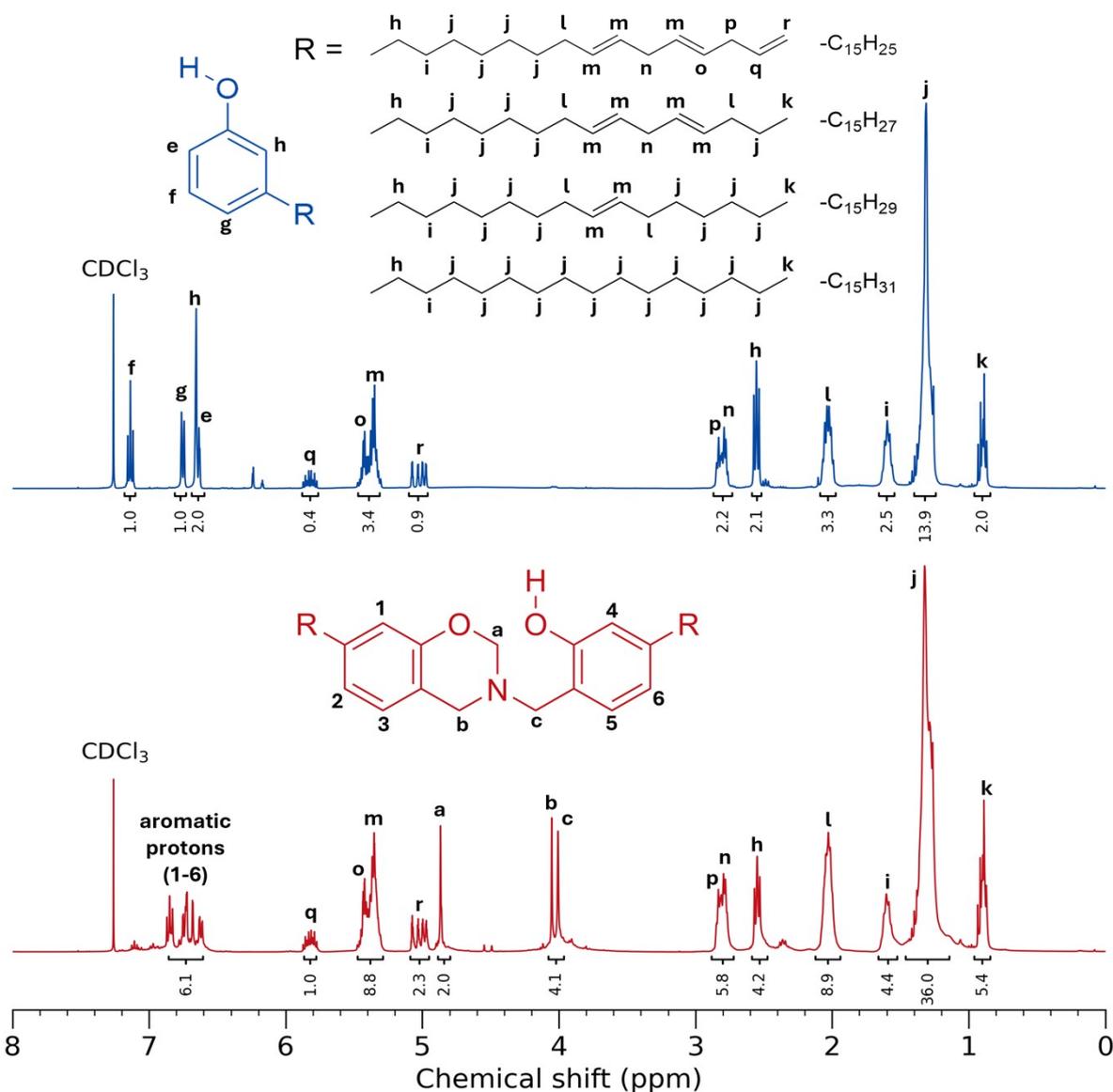


Figure S3. Qualitative analysis of NMR spectra

The calculated conversion yield is 98.4%, based on comparison of the integrals of aromatic protons to the oxazine O-CH₂-N protons in our obtained product. The following formula was used for the calculation of the conversion yield: (obtained ratio of aromatic protons to the oxazine O-CH₂-N protons/ theoretical full ratio of the aromatic protons to oxazine O-CH₂-N protons) × 100 %.

To evaluate the thermal properties and degradation profile of the plywood substrate, DSC was performed using a TA Instruments DSC Q10 using aluminium hermetic pans, performed under N₂ flow at a rate of 10 °C/min from 30 °C to 390 °C. TGA were performed in a TA Instruments Q500 under N₂ in a temperature range of 30 °C to 650 °C.

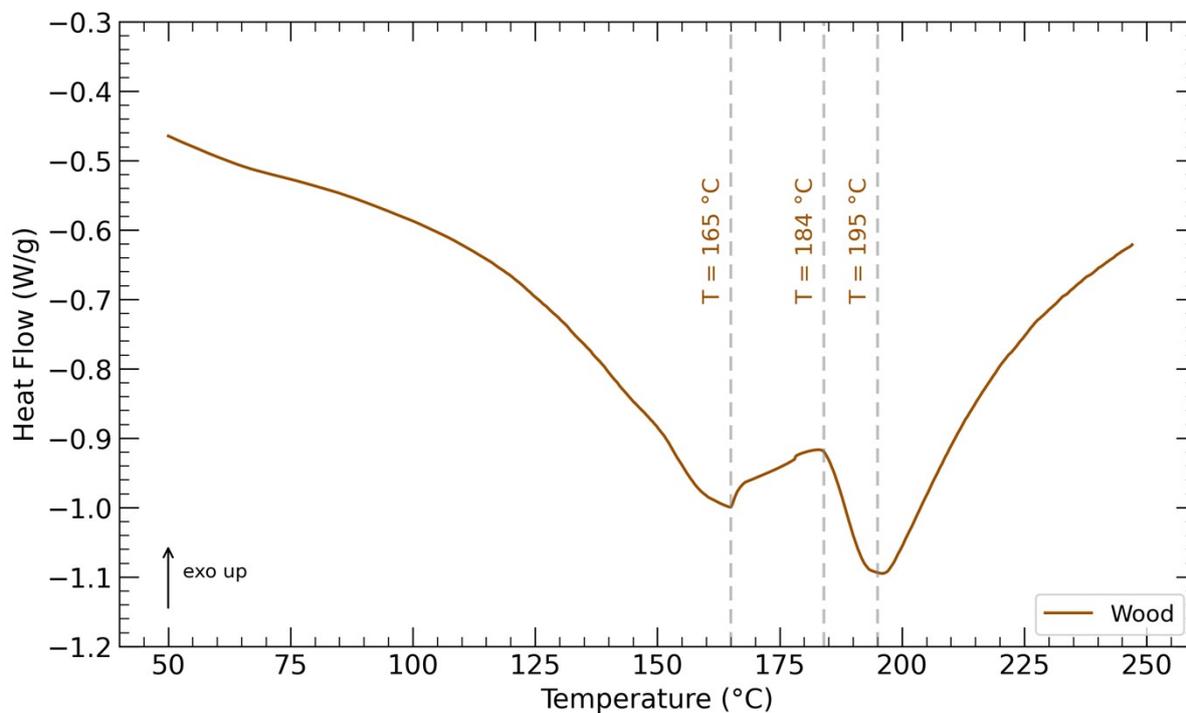


Figure S4. DSC of plywood substrate under N₂ at 10 °C min⁻¹

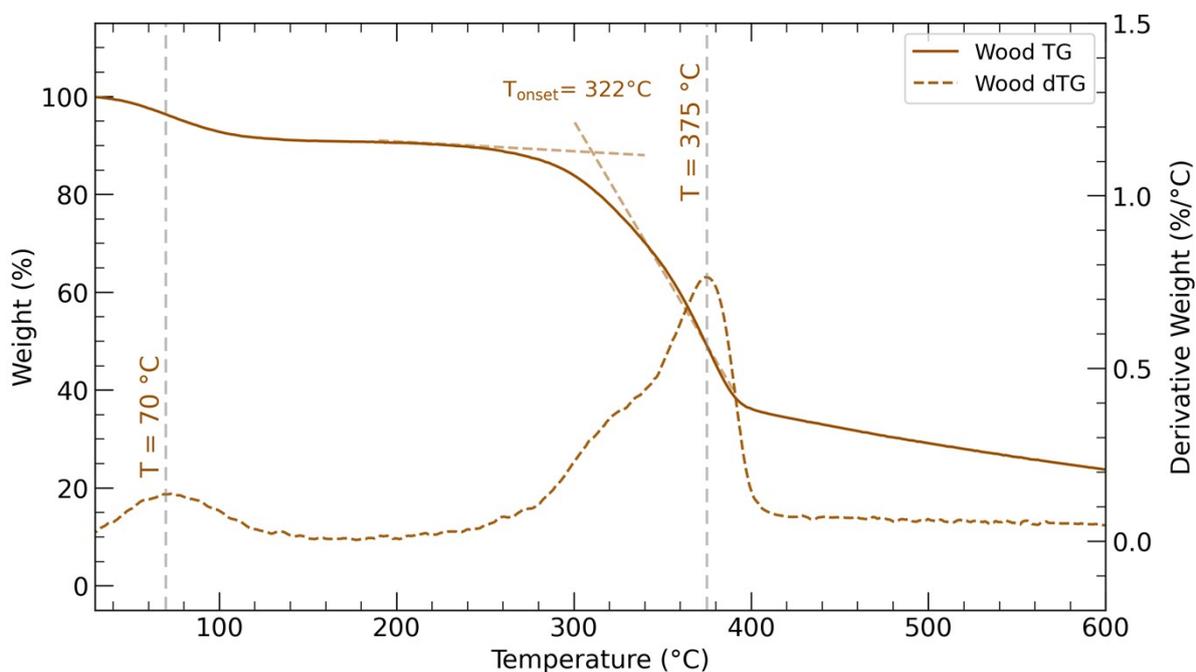


Figure S5. TGA and DTGA of plywood substrate under N₂ at 20 °C min⁻¹

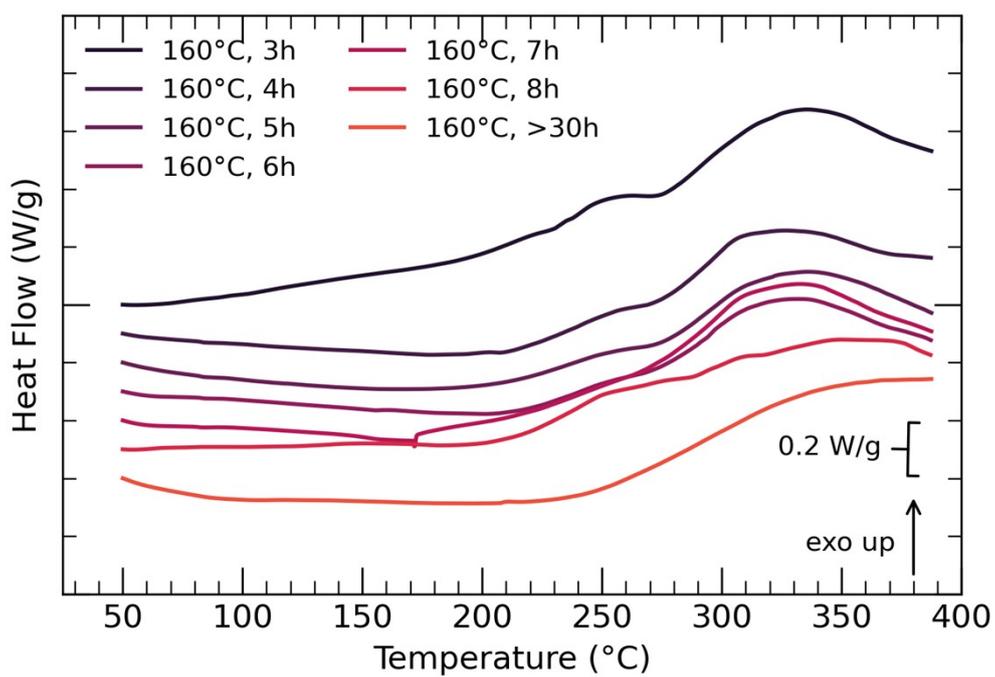


Figure S6. DSC of polybenzoxazine cured under different time conditions at 10 °C min⁻¹.

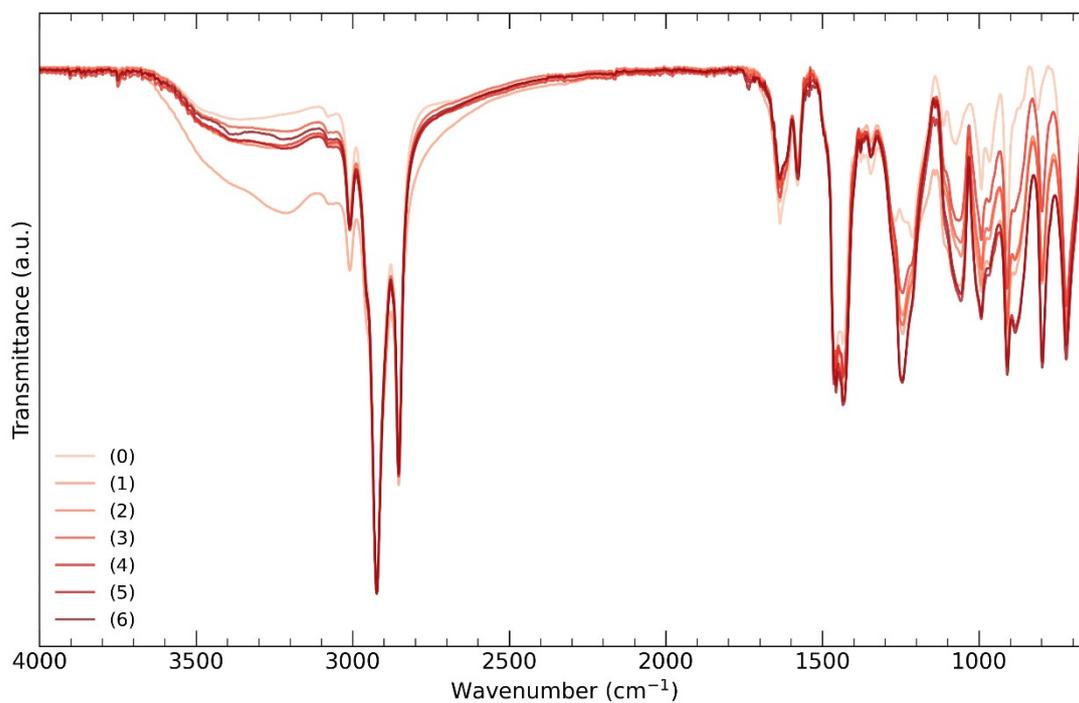


Figure S7. FTIR of coatings

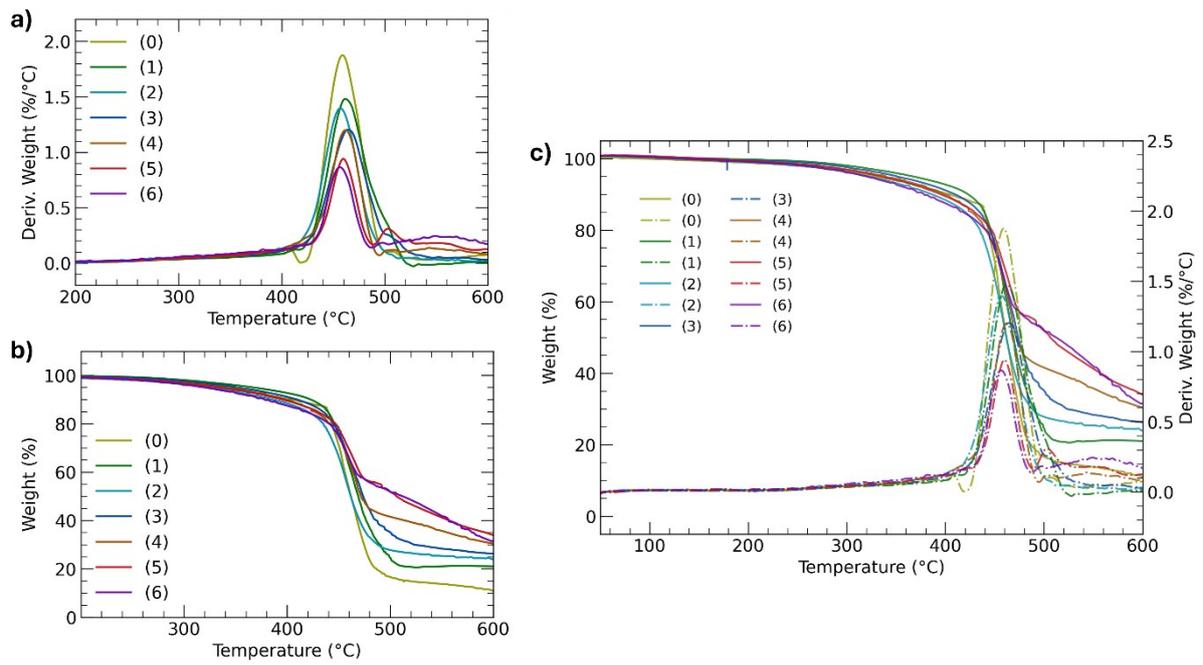


Figure S8. TGA of coatings under N₂ at 20 °C min⁻¹. (a) TGA of coatings (b) DTGA of coatings. (c) TGA and DTGA of coatings.

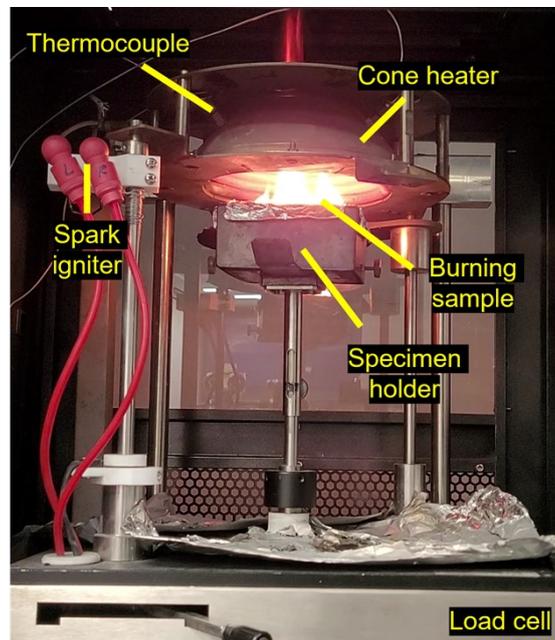


Figure S9. Image of cone calorimeter test set up

Table S1. UL-94 vertical burning test

	Average afterflame time, t1	Average afterflame time, t2	Total afterflame time (t1+t2) for 5 samples	Dripping	Rating
Uncoated	Complete burn	-	-	No	No rating
(0)	Complete burn	-	-	No	No rating
(1)	Complete burn	-	-	No	No rating
(2)	25.2	14.0	196	No	V-1
(3)	10.4	9.8	101	No	V-1
(4)	5.0	9.4	72	No	V-1
(5)	3.4	6.2	48	No	V-0
(6)	0	8.0	40	No	V-0

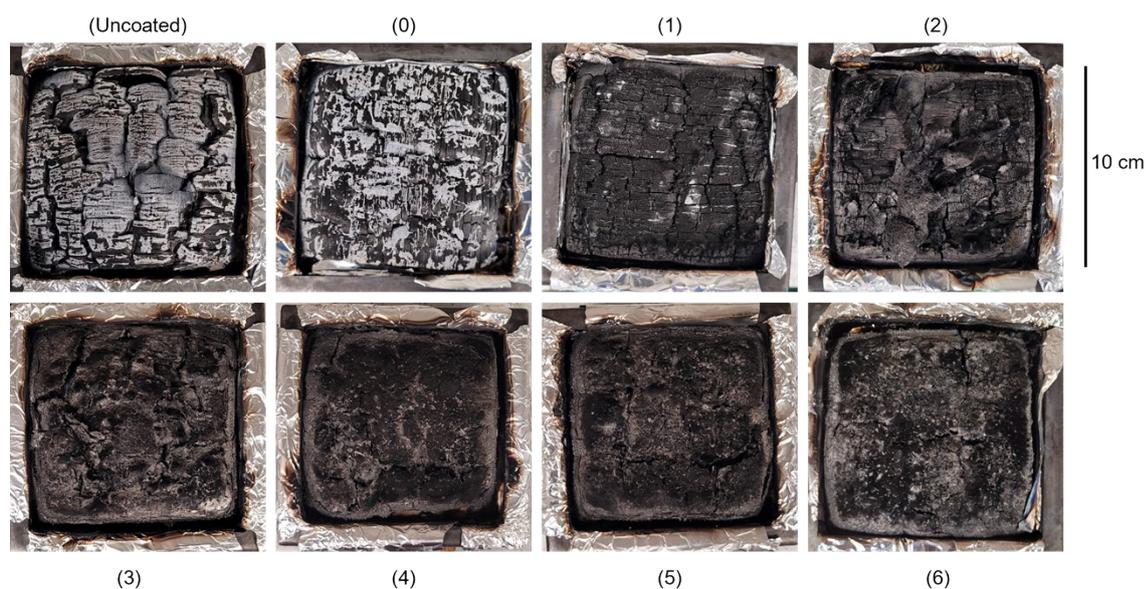


Figure S10. Optical images of samples after cone calorimetry test

Table S2. Average final dry coating thickness

Sample	Average coating thickness (mm)
(0)	0.141
(1)	0.120
(2)	0.105
(3)	0.087
(4)	0.106
(5)	0.125
(6)	0.188

Overall average dry final coating thickness: 0.119 mm