

Supplementary information for

**Eco-benign PVA/aluminum phosphate adhesives as
formaldehyde alternative in wood-based panel**

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Figure S1. Digital images of AP, PAP-1%, PAP-2% and PAP-3%

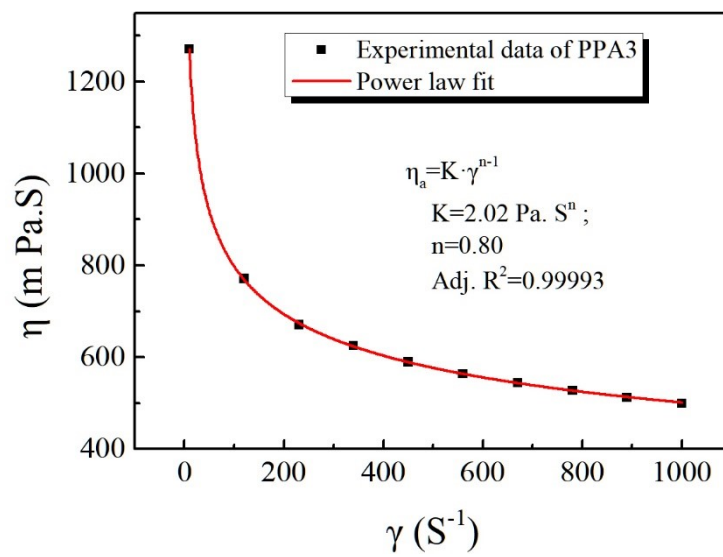


Figure S2. Experimental data and Power law fit of PAP-3 in viscosity versus velocity

gradient

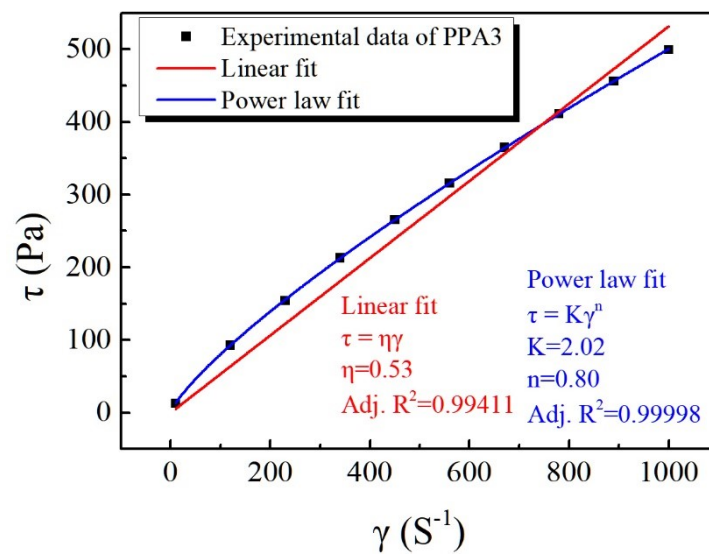


Figure S3. Experimental data and different fit modes of PAP-3 in shearing stress versus velocity gradient

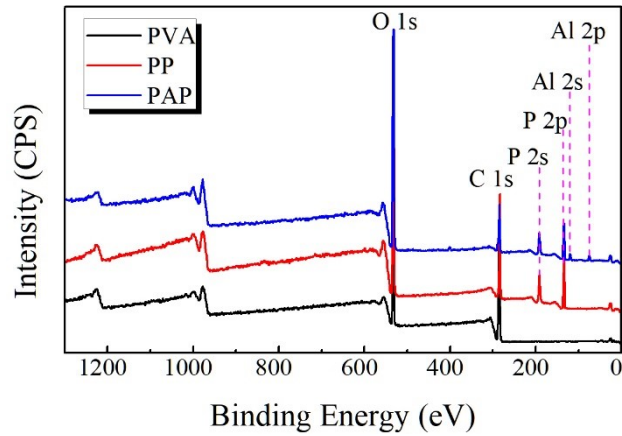


Figure S4. XPS survey spectra of PVA, PP and PAP

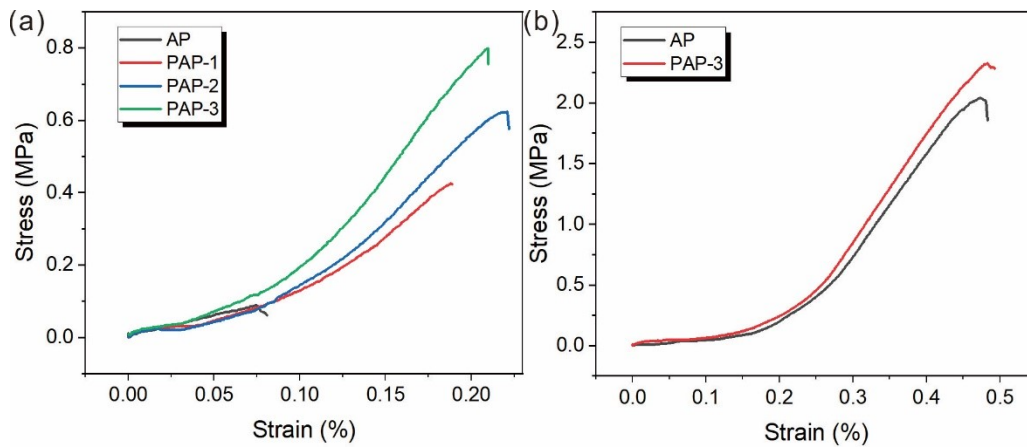


Figure S5. Stress vs strain curves of AP and PAP: (a) wet and (b) dry bonding strength tests

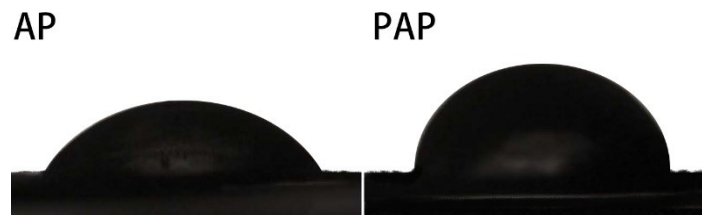


Figure S6. Contact angle tests of AP and PAP

Table S1. The viscosity value obtained by linear fitting from Figure 3(b)

Viscosity	AP	PAP-1%	PAP-2%
η (Pa)	0.02	0.05	0.20
Adj. R ²	0.999987	0.999997	0.99982

Table S2. Details of linear and power law fit of PAP-3

Linear fit				Power law fit			
Equation	Adj. R2	a	b	Equation	Adj. R2	a	b
$Y=a+b*x$	0.99172	35.94	0.48027	$Y=a*x^b$	0.99998	2.06	0.7951

Table S3. Viscosity at Room Temperature (η_{RT}) and the Maximum Viscosity at $T_{max}(\eta_{max})$ of AP, PAP-1, PAP-2 and PAP-3.

Sample	AP	PAP-1	PAP-2	PAP-3
η_{RT} (m Pa·S)	31.3	320.0	347.1	791.6
η_{max} (m Pa·S)	1445	919615	679990	455422
Tmax (°C)	163.5	166.2	176.8	185.6

Table S4. Onset temperature (OT), peak temperature of thermal decomposition (PT), and the residual weight (RW) of different AP adhesives

Sample	OT (°C)	PT1 (°C)	PT2 (°C)	PT3 (°C)	RW (%)
AP	121	148	158	171	65.25%

PAP-1%	116	133	153	193	65.13%
PAP-2%	120	145	160	193	67.62%
PAP-3%	129	154	177	227	68.32%

Table S5. Onset temperature (OT), peak temperature of thermal decomposition (PT), and the residual weight (RW) of W, PVA and wood-based samples

Sample	OT (°C)	PT1 (°C)	PT2 (°C)	RW (%)
W	303.8	340.2	502.2	4.85%
PVA	210.0	321.4	417.9	2.72%
APW	267.5	301.7	516.6	10.52%
PAPW	287.4	287.4	542.0	18.89%