

## Supporting information

### Synthesis of a Furfural-Based DOPO-Containing Co-Curing Agent for Fire-Safe Epoxy Resins

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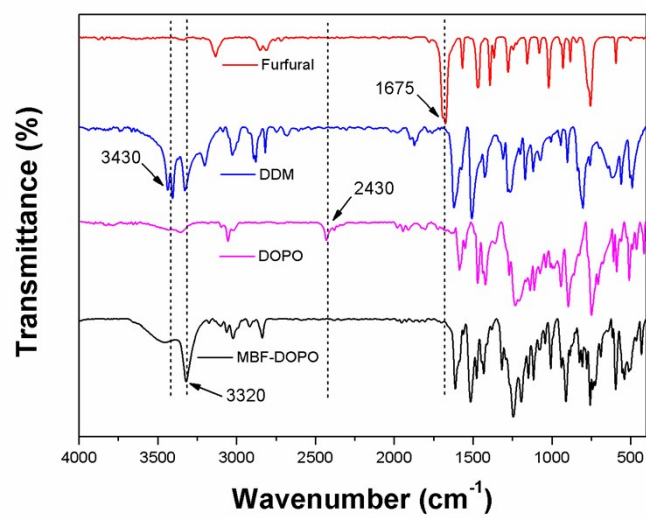
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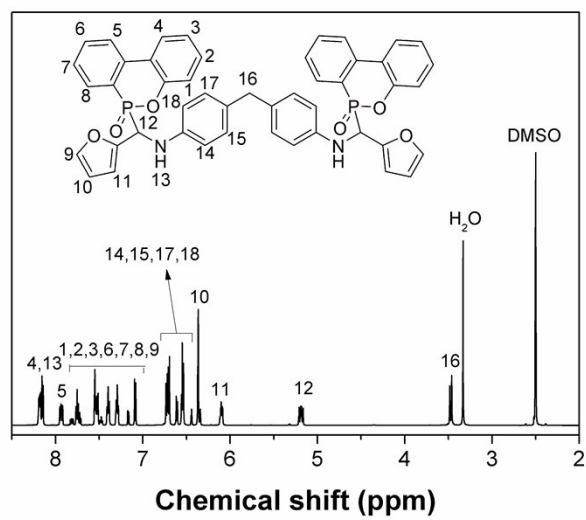
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**Fig. S1** FTIR spectra of furfural, DDM, DOPO and MBF-DOPO



**Fig. S2** The assignment of peaks in the <sup>1</sup>H-NMR spectrum of MBF-DOPO

**Table S1** Exothermic peak temperatures of EP-0 and EP-4.0 cured at varying heating rates

Samples	Heating rate (°C/min)	$T_p$ (°C)
EP-0	2.5	129.1
	5	140.3
	10	156.3
	15	168.9
	20	177.6
EP-4.0	2.5	116.5
	5	129.4
	10	148
	15	159.3
	20	171.5

**Table S2** Apparent activation energy of curing reaction for EP-0 and EP-4.0

Samples	$E_a$ (kJ/mol)	$R^2$
EP-0	50.4±0.24	0.998
EP-4.0	47.3±0.18	0.999

**Table S3** Cone calorimeter test results of EP-0 and EP-4.0

Samples	$TTI$ (s)	$PHRR$ (kW/m <sup>2</sup> )	$THR$ (MJ/m <sup>2</sup> )	Residual mass (wt %)	$TSP$ (m <sup>2</sup> )
EP-0	50±2	962±12	151±5	17.9±0.3	140±3
EP-4.0	47±1	680±10	132±4	8.6±0.2	93±1

**Table S4** XPS analysis of char residues after CCT

Samples	C (wt %)	O (wt %)	N (wt %)	P (wt %)
EP-0	80.87±0.18	14.92±0.13	4.21±0.06	0
EP-4.0	83.77±0.21	12.23±0.11	3.68±0.05	0.32±0.02

**Table S5** Thermal properties of EP-0 and EP-4.0

Samples	Nitrogen				Air			
	$T_{d\ 5\%}$ (°C)	$T_{d\ max}$ (°C)	$R_{max}$ (%/min)	Residue (%)	$T_{d\ 5\%}$ (°C)	$T_{d\ max}$ (°C)	$R_{max}$ (%/min)	Residue (%)
EP-0	387.9	400.7	36.5	14.7	386.1	398.3	31.3	1.93
EP-4.0	366.7	385.7	27.4	21.8	353.8	387.2	21.8	2.07

**Table S6** Key results of EP-0 and EP-4.0 from DMA

Samples	E' at 30 °C (GPa)	T <sub>g</sub> (°C)	v <sub>e</sub> (10 <sup>3</sup> mol/m <sup>3</sup> )
EP-0	2.89±0.03	162.2±1.22	5.05±0.10
EP-4.0	3.05±0.04	159.5±1.57	4.99±0.17