



Camphoric acid-derived biobased (co)polyesters: synthesis and characterization

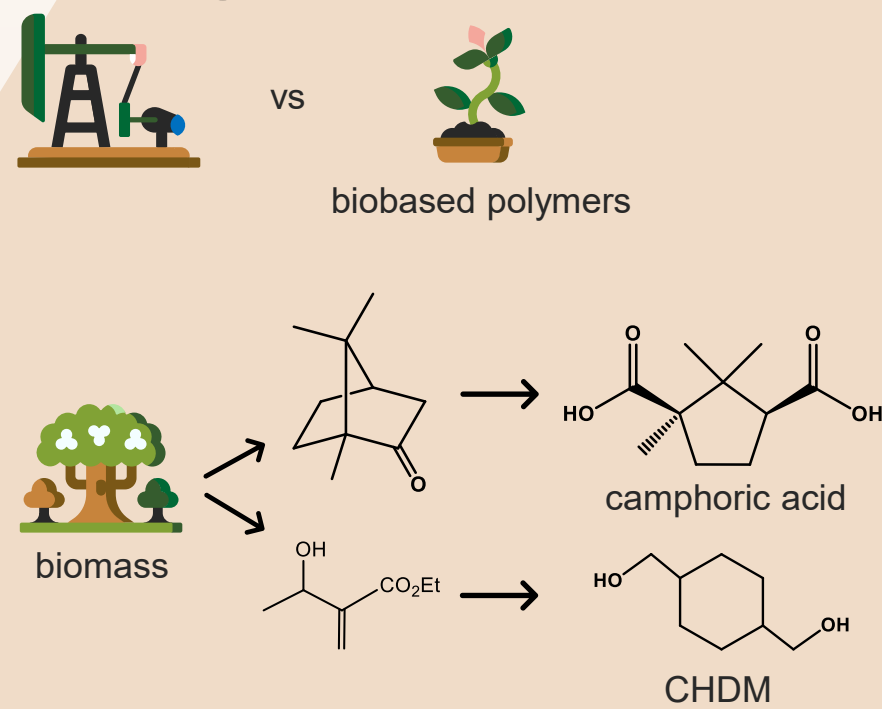
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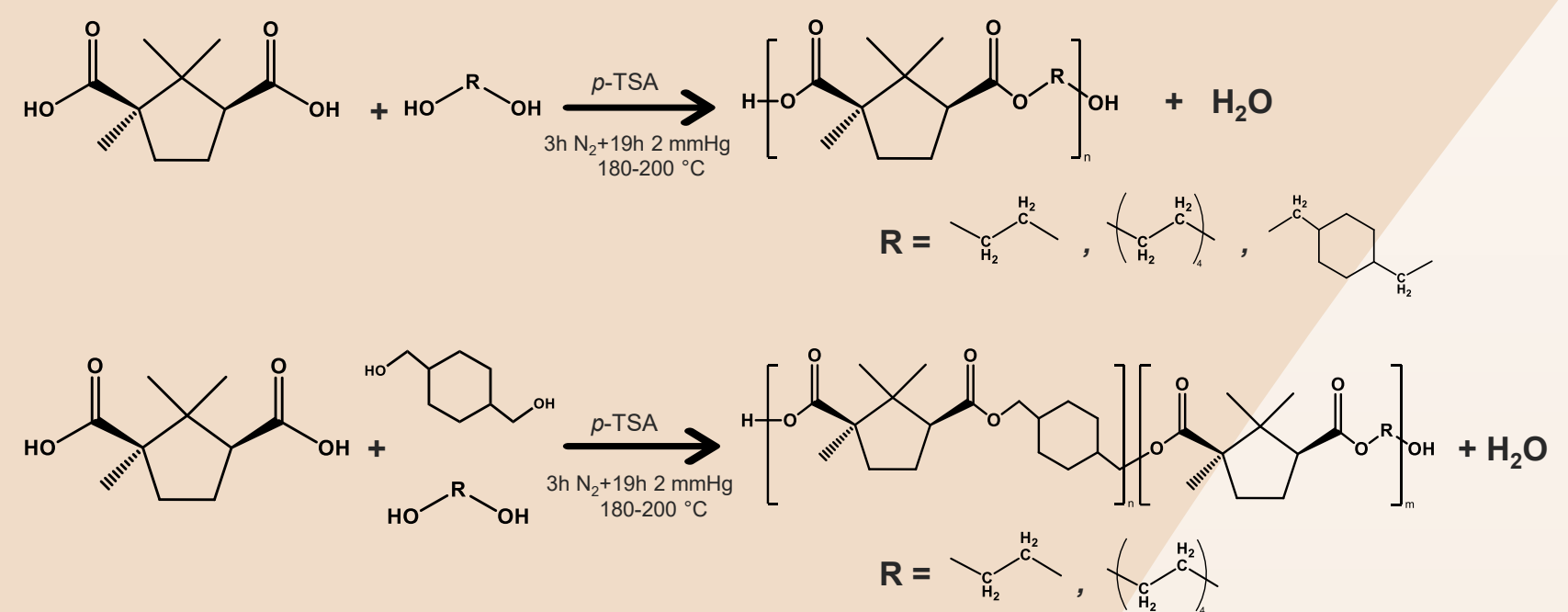
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Background



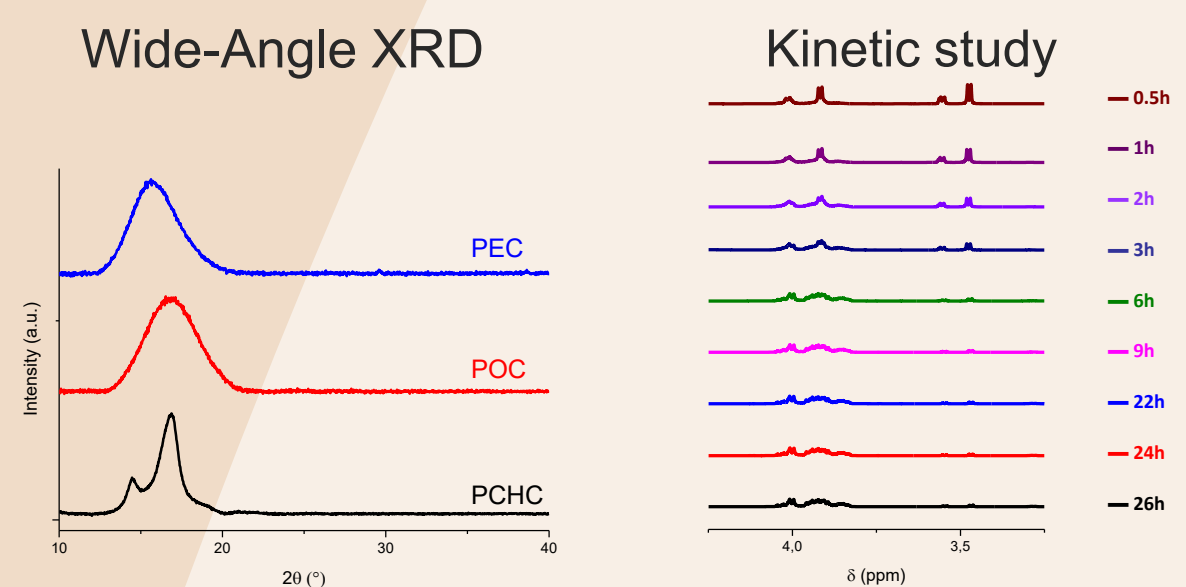
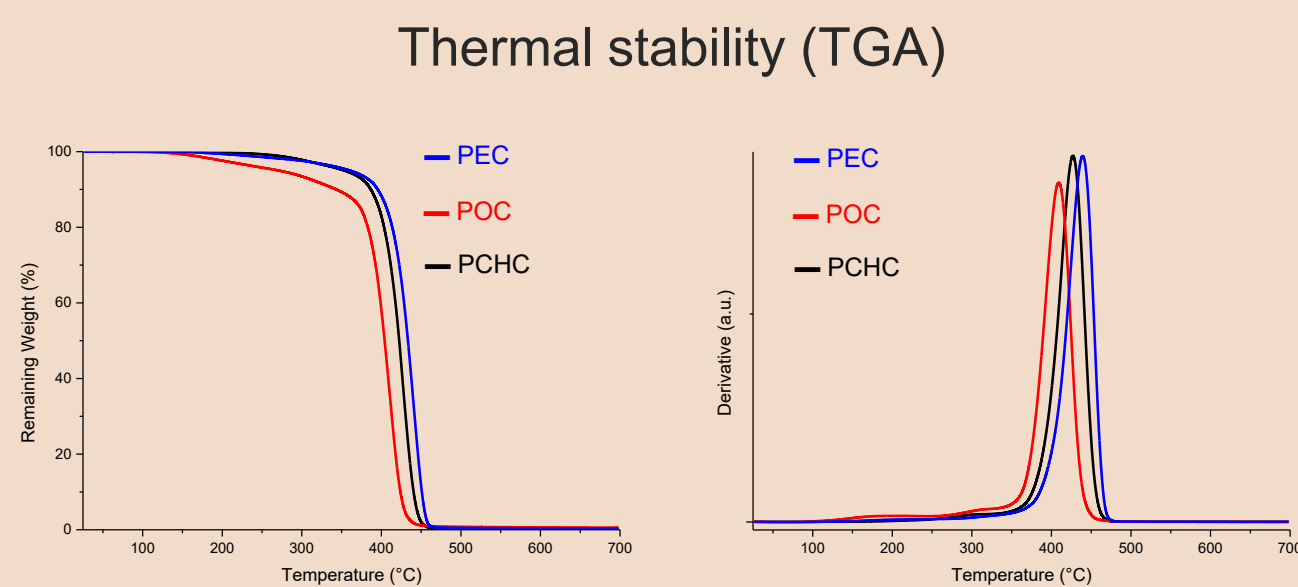
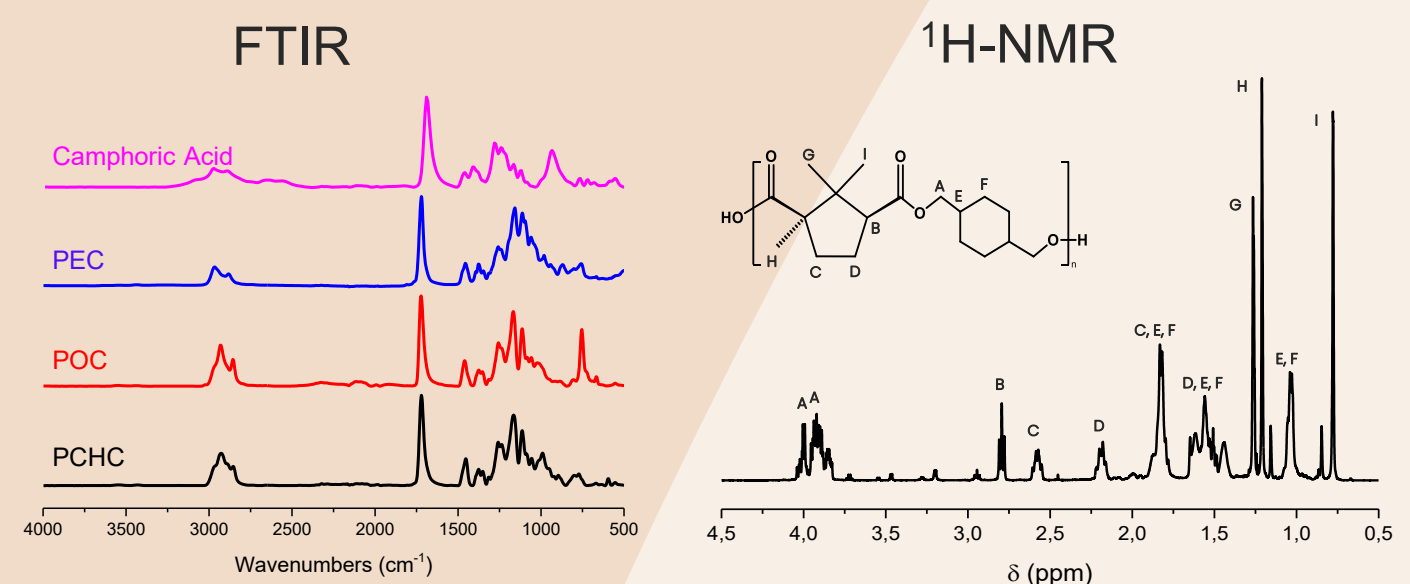
Experiments



Results

Camphoric acid-based polyesters

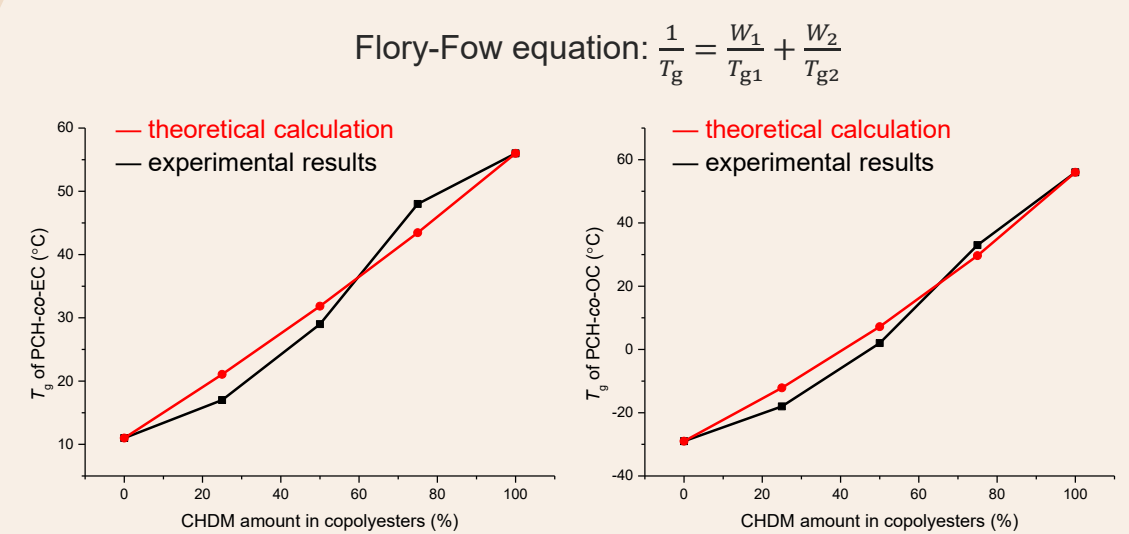
Abbr.	Structure	$\overline{M}_n$ (g/mol)	$\overline{D}$	y (%)	T_g (°C)	T_m (°C)
PEC		14,000	1.7	43	11	-
POC		14,700	3.4	63	-29	-
PCHC		4,500	1.9	65	56	99/162



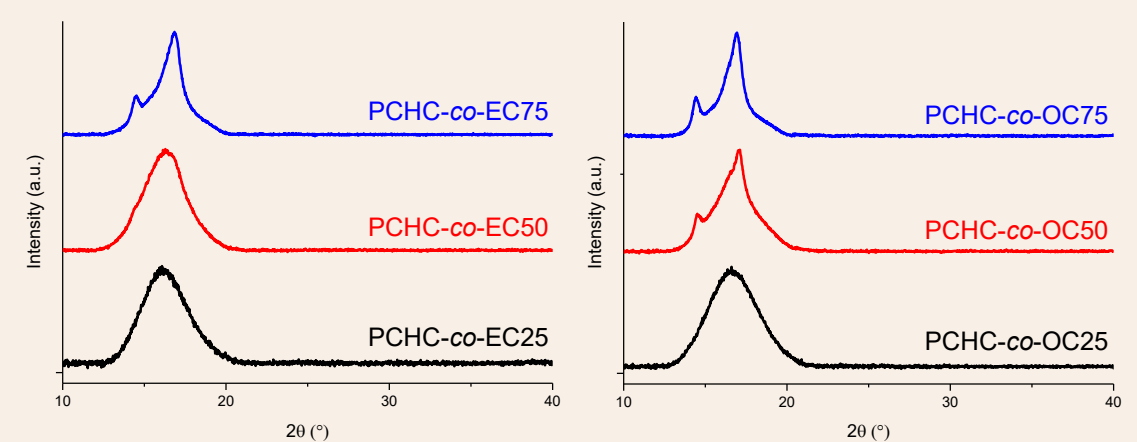
Camphoric acid-based copolyesters

Copolymers	Molar fraction (%)				$\overline{M}_n$ (g/mol)	$\overline{D}$	y (%)
	Feed		Copolyester				
	F _{CHC}	F _{EC}	X _{CHC}	X _{EC}			
PCHC-co-EC25	25	75	29	71	8,800	2.6	77
PCHC-co-EC50	50	50	56	44	5,600	2.6	70
PCHC-co-EC75	75	25	78	22	9,500	2.3	78
	F _{CHC}	F _{OC}	X _{CHC}	X _{OC}			
PCHC-co-OC75	25	75	28	72	11,100	2.6	82
PCHC-co-OC75	50	50	49	51	5,700	3.4	69
PCHC-co-OC75	75	25	72	28	8,600	2.3	81

Thermal properties (DSC)



Wide-Angle XRD



Conclusions

- Novel biobased (co)polyesters based on camphoric acid have been successfully synthesized.
- (Co)polyesters with $\overline{M}_n$ 4,500-14,700 g/mol were achieved through bulk polycondensation.
- The glass transition temperatures follow the sequence: T_g PCHC > T_g PEC > T_g POC.
- The obtained (co)polyesters are thermally stable up to 410 – 428 °C.
- The incorporation of cyclic diol 1,4-CHDM further increases the T_g of copolyesters.
- WAXD shows that only 1,4-CHDM produces semicrystalline polymers.

Acknowledgements

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References

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