AIEGENs METHACRYLATE COPOLYMERS FOR LUMINESCENT SOLAR CONCENTRATORS

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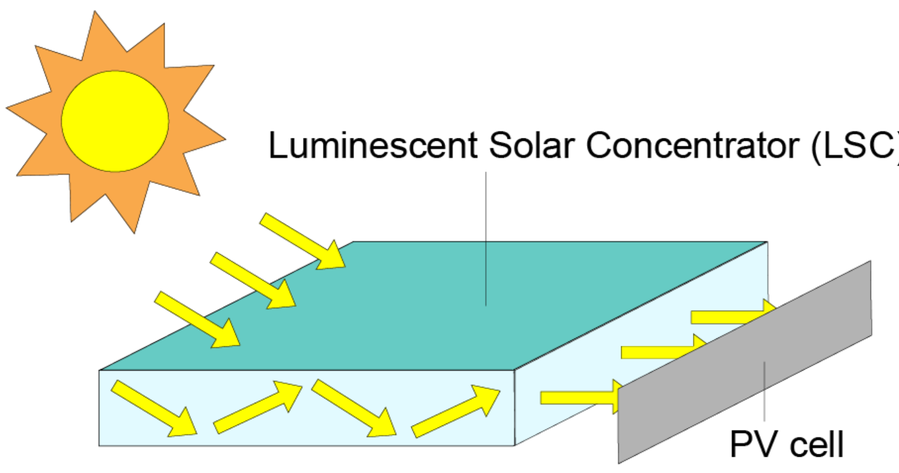
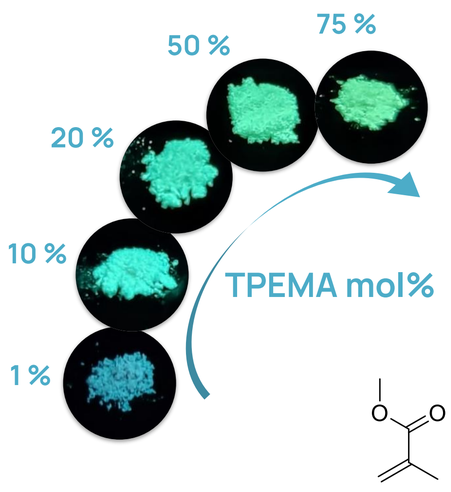
INTRODUCTION

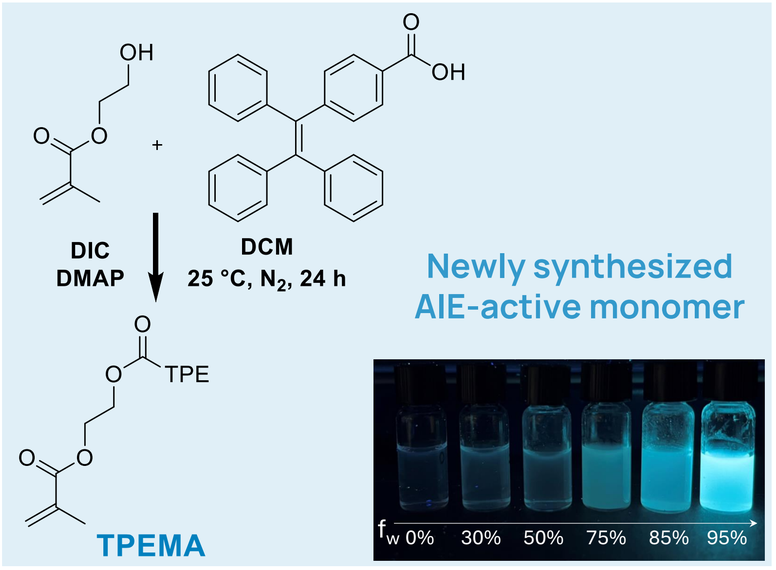
Luminescent solar concentrators (LSCs) represent an interesting solution for light harvesting, management and conversion, efficiently operating under both direct and diffuse light conditions.[1]



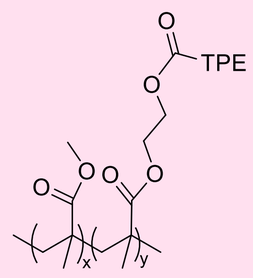
Conventional luminophores often exhibit diminished photoluminescence in concentrated solutions or at the solid state, negatively affecting the final performance of the devices. To overcome these limitations, the present work investigates the enhanced emission properties associated with **aggregation-induced emission (AIE)** emitters.[2]

SYNTHETIC PROCEDURE

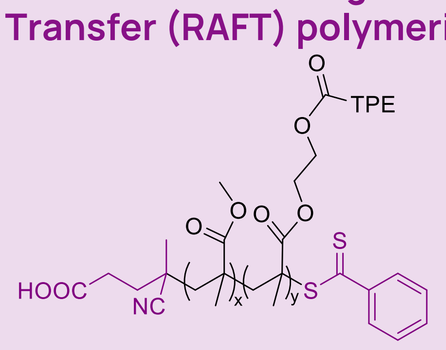




Free Radical (FR) polymerization

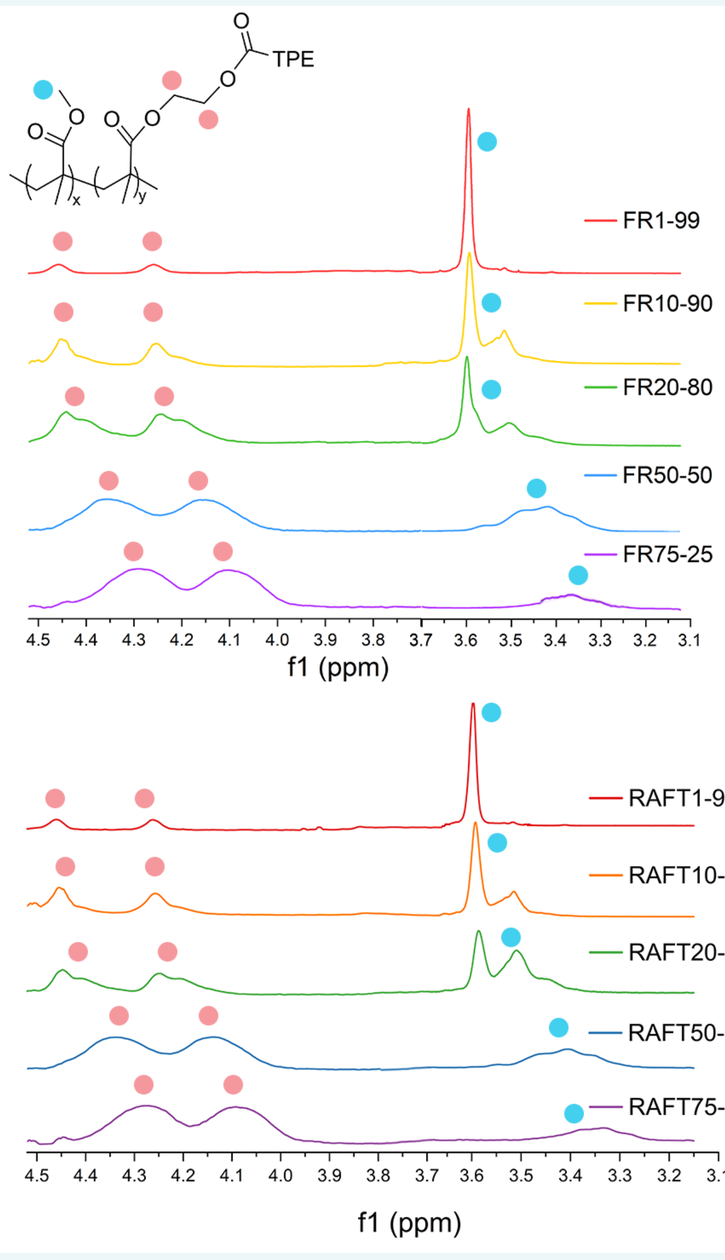


Reversible Addition-Fragmentation chain Transfer (RAFT) polymerization [3]



RESULTS AND DISCUSSION

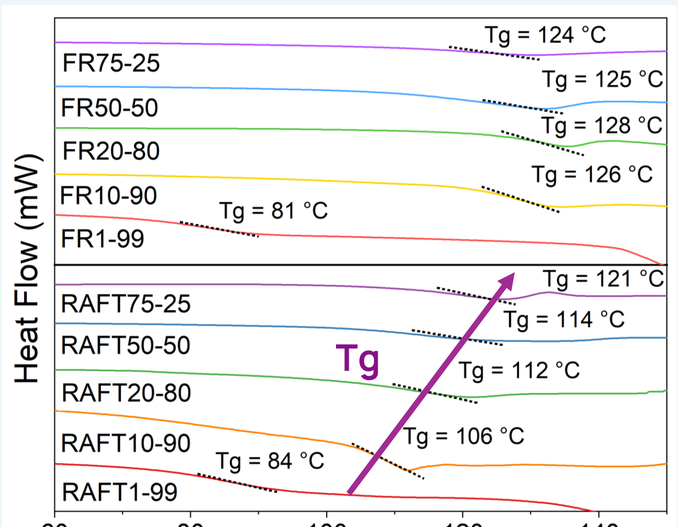
MOLECULAR and THERMAL characterization

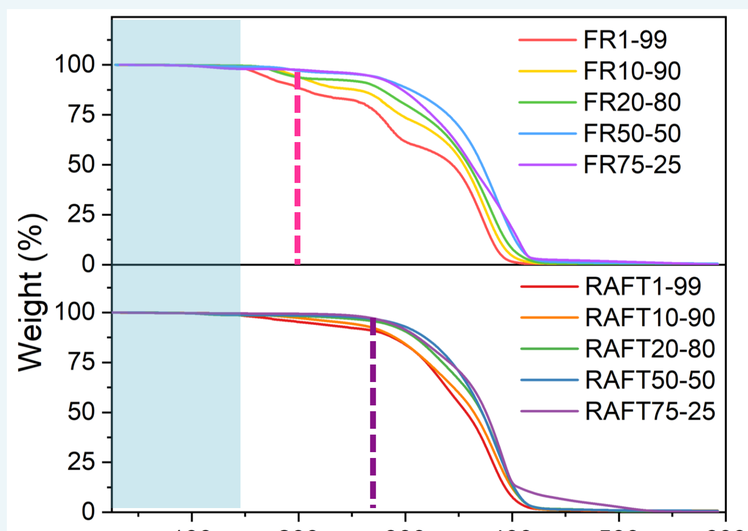


Sample	Feed comp. TPEMA/MMA (%)	Observed comp. TPEMA/MMA (%)	$Đ$	$T_{g,exp}$ (°C)	$T_{g,theo}$ (°C)
FR1-99	1/99	1/99	1.82	81	101
FR10-90	10/90	11/89	1.91	126	107
FR20-80	20/80	18/82	1.66	128	111
FR50-50	50/50	50/50	1.94	125	118
FR75-25	75/25	72/28	1.76	124	121
RAFT1-99	1/99	1/99	1.15	84	101
RAFT10-90	10/90	12/88	1.21	106	107
RAFT20-80	20/80	24/76	1.21	112	111
RAFT50-50	50/50	51/49	1.18	114	118
RAFT75-25	75/25	71/29	1.21	121	121

narrower

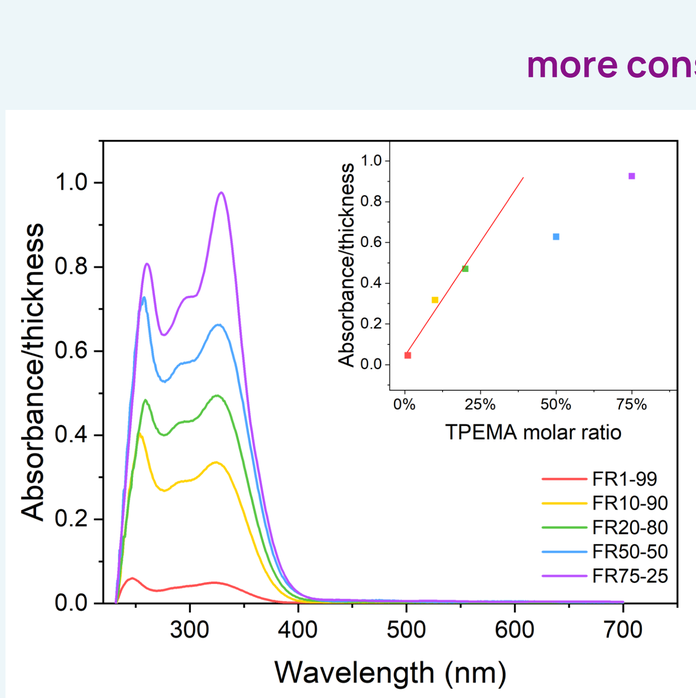
more consistent

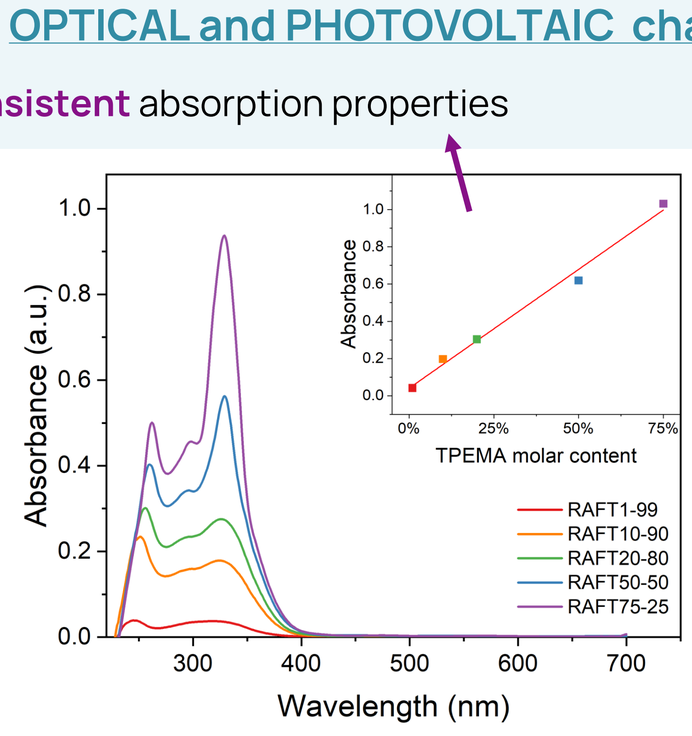




OPTICAL and PHOTOVOLTAIC characterization

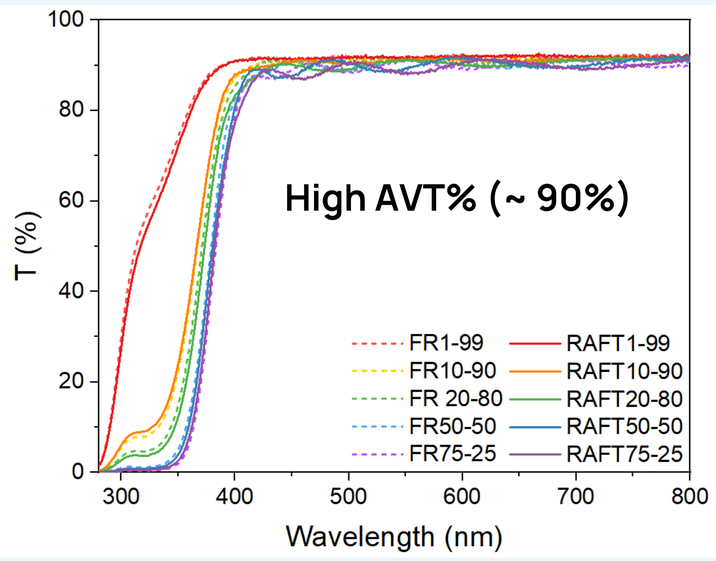
more consistent absorption properties





$$\eta_{ext}^{max} = \frac{Nº\ of edge\ emitted\ photons}{Nº\ of\ incident\ photons}$$

FR: 1.35%
RAFT: 1.64%



CONCLUSIONS

This study illustrates a promising approach for enhancing the efficiency of LSCs through the manipulation of macromolecular architecture and the strategic incorporation of AIE-active species within polymer matrices.

REFERENCES / ACKNOWLEDGEMENT

1) S. Castelletto, A. Boretti, *Nano Energy* 109 (2023) 108269.
2) E. Tatsi, A. Nitti, D. Pasini, G. Griffini, *Nanoscale* 16 (2024) 15502–15514.
3) N. K. S. Teo, B. Fan, A. Ardana, S. H. Thang, *Aggregate* 5 (2024) e414.

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