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Anthracene-containing polymers toward high-end applications

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Abstract

Anthracene, with its unique properties originating from the linearly fused benzene ring structure, has a long history in polymer science in numerous application areas. The most commonly used reasons are their (tunable) luminescence, easy energy and charge transfer as well as unique photo- and thermoreversible dimerization properties. Aside from [4+4]-photocycloadditions, anthracene is also able to undergo extremely fast Diels-Alder reactions with maleimides. The use of (non)reactive anthracene moieties in polymers is therefore following a constant publication increase that is expected to continue in the future in order to meet the need for more advanced materials. This review aims to give a critical overview of the literature dealing with anthracene-containing polymers and provide some insights for future research directions.

Keywords: Anthracene polymer; fluorescent detector; conjugated polymer; reversible dimerization; Diels-Alder

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List of abbreviations:

An	anthracene	PET	poly(ethylene terephthalate)
CB[8]	cucubit[8]uril	PMMA	poly(methyl methacrylate)
FRET	Förster resonance energy transfer	POSS	polyhedral oligomer silsesquioxane
HDI	hexamethylene diisocyanate	PS	polystyrene
LB	Langmuir-Blodgett	r	fluorescence anisotropy ratio
LCST	lower critical solution temperature	T_g	glass transition temperature
MALDI	matrix assisted laser desorption/ionization	UV	ultraviolet
		UVA	ultraviolet A
MDI	4,4'-diphenymethylene diisocyanate	UVC	ultraviolet C
PAH	polycyclic aromatic hydrocarbon	α-CD	α-cyclodextrine
PBLG	poly(gamma-benzyl-L-glutamate)	β-CD	β-cyclodextrine
PEG	poly(ethylene glycol)	γ-CD	γ-cyclodextrine
PEO	poly(ethylene oxide)		