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A Four-Atom Linker to Label Macromolecules with a Pyrene Derivative that Responds to Local Polarity

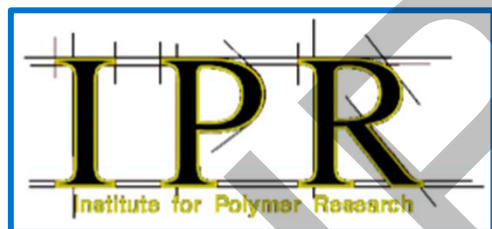
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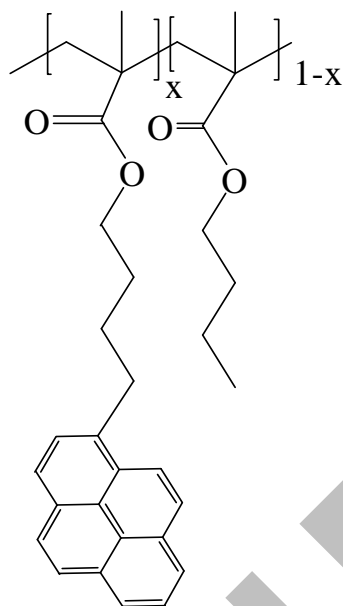


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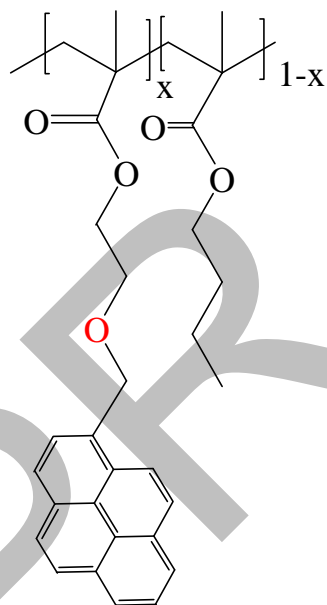
Sample Preparation

Poly(methacrylates) were randomly labeled with pyrene via radical copolymerization

PyBut-PC4MA



PyMeOEtO-PC4MA



✓ NMR :

- ✓ Determine the degree of conversion.

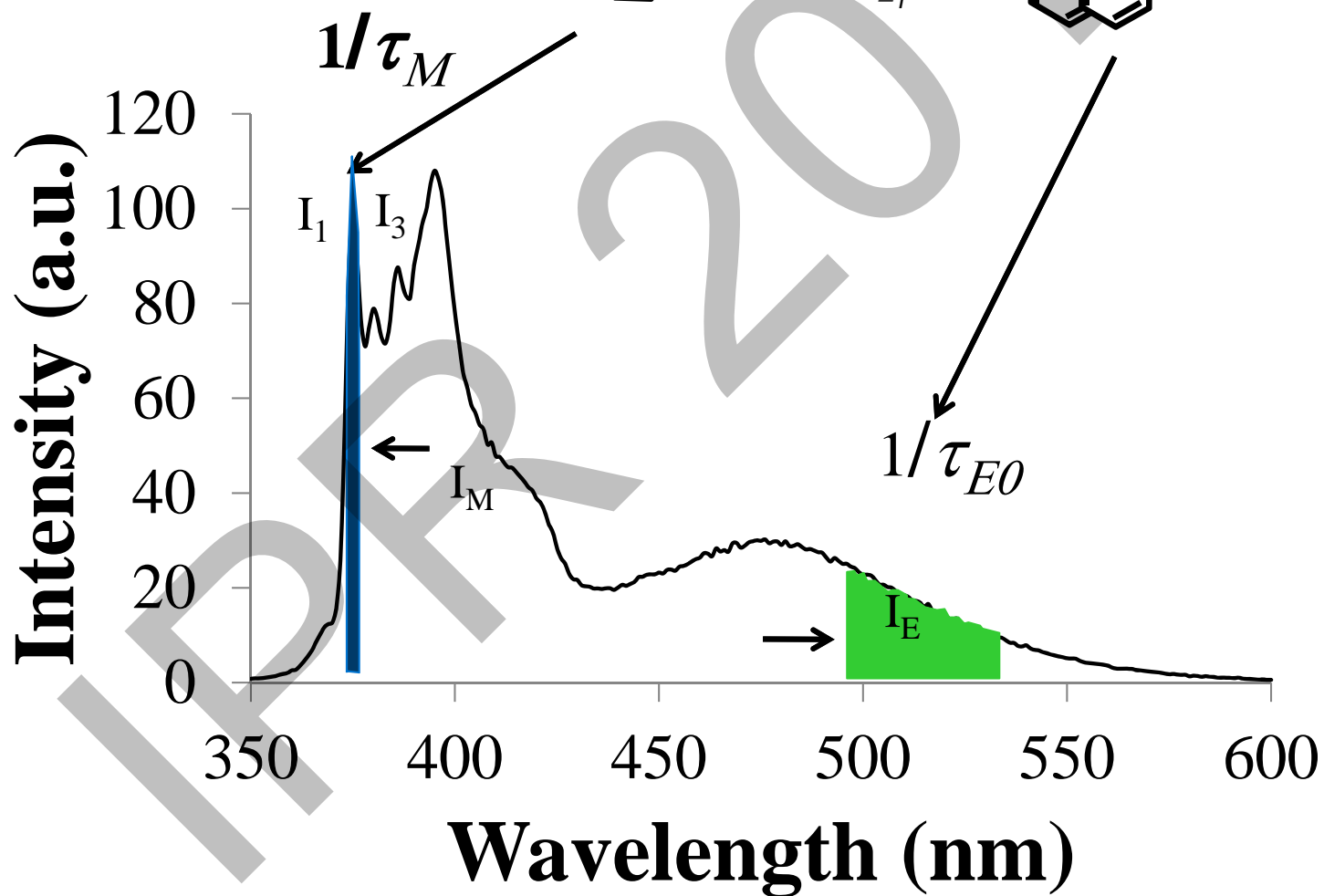
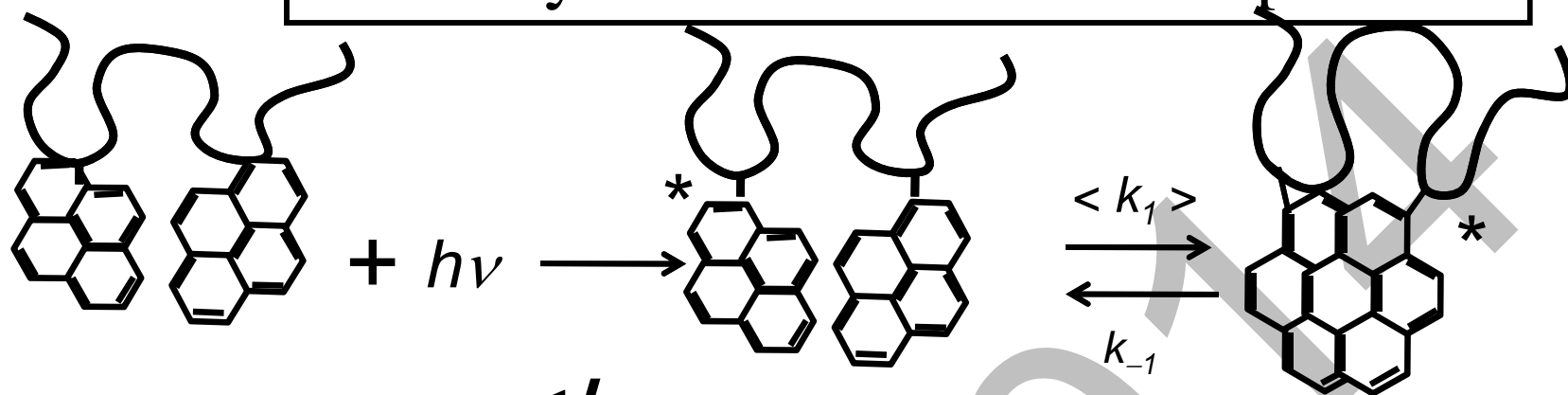
✓ GPC:

- ✓ Check for unreacted pyrene monomer using UV-Vis absorption detector.
- ✓ Determine molecular weight.

✓ Absorption spectroscopy:

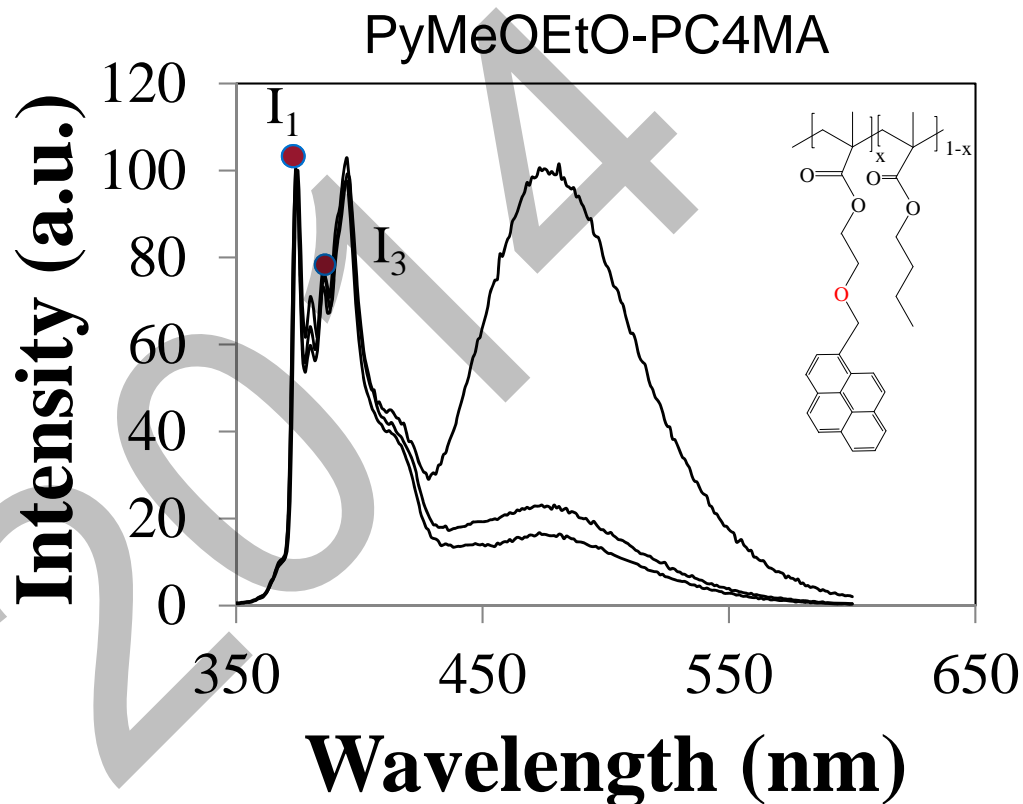
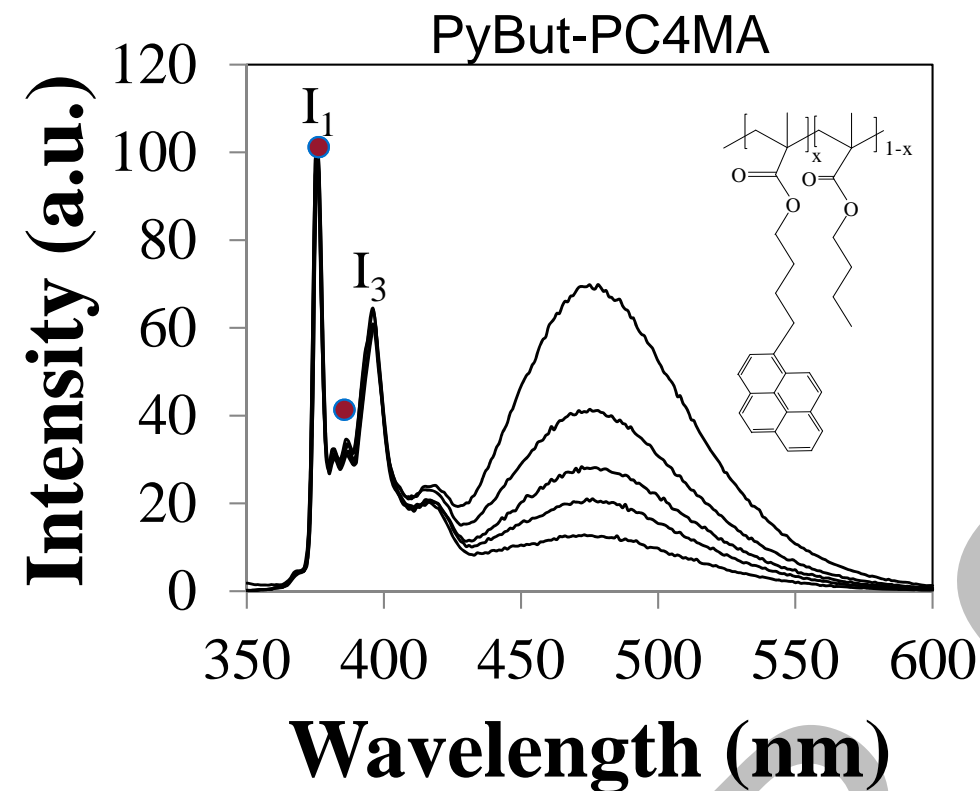
- ✓ Pyrene content was determined for all polymer samples.

Steady-State Fluorescence Spectra



(I_1/I_3) of pyrene emission was used to monitor the local environment of the pyrene molecules

I_1/I_3 Ratios in THF Using Steady-State Fluorescence Spectra

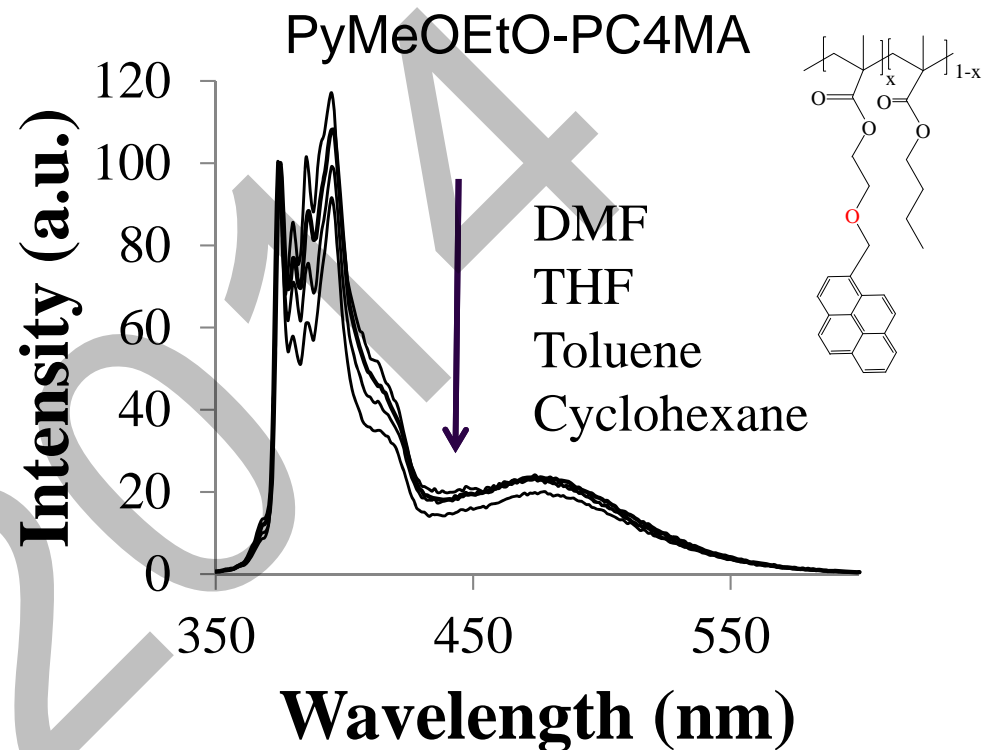
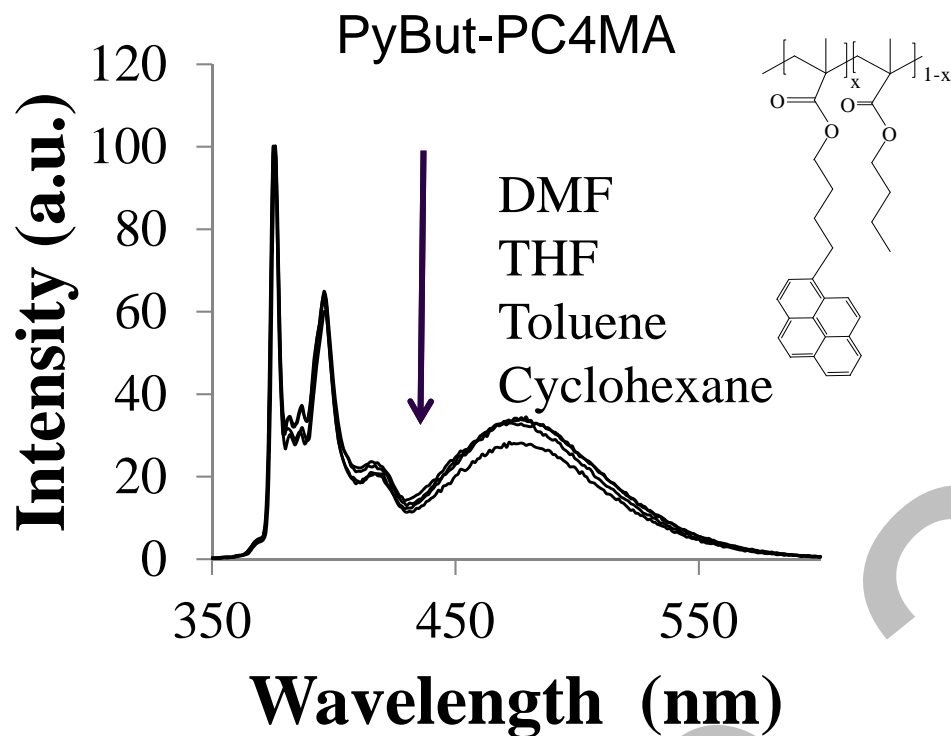


Pyrene Content mol%	I_1/I_3 Ratio (THF)
2.20	3.18
2.90	3.00
3.60	3.13
5.20	2.90
7.20	3.00

Pyrene Content mol%	I_1/I_3 Ratio (THF)
1.3*	1.37
1.8	1.32
4.7*	1.30

Samples with (*) has been prepared by Remi Casier
(Prof. JD lab)

I_1/I_3 Ratios Using Steady-State Fluorescence Spectra



Solvent	Polarity index	I_1/I_3 Ratio
DMF	6.4	3.24
THF	4.0	3.13
Toluene	2.4	2.75
Cyclohexane	0.2	2.61

Solvent	Polarity index	I_1/I_3 Ratio
DMF	6.4	1.64
THF	4.0	1.32
Toluene	2.4	1.13
Cyclohexane	0.2	1.00

Acknowledgements

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- **Prof. Mario Gauthier**
- **Duhamel and Gauthier Group**
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