Supporting Information

(Revised)

Title: Probing the Role of Chain Length on the Diffusion Dynamics of π-Conjugated Polymers by Fluorescence Correlation Spectroscopy

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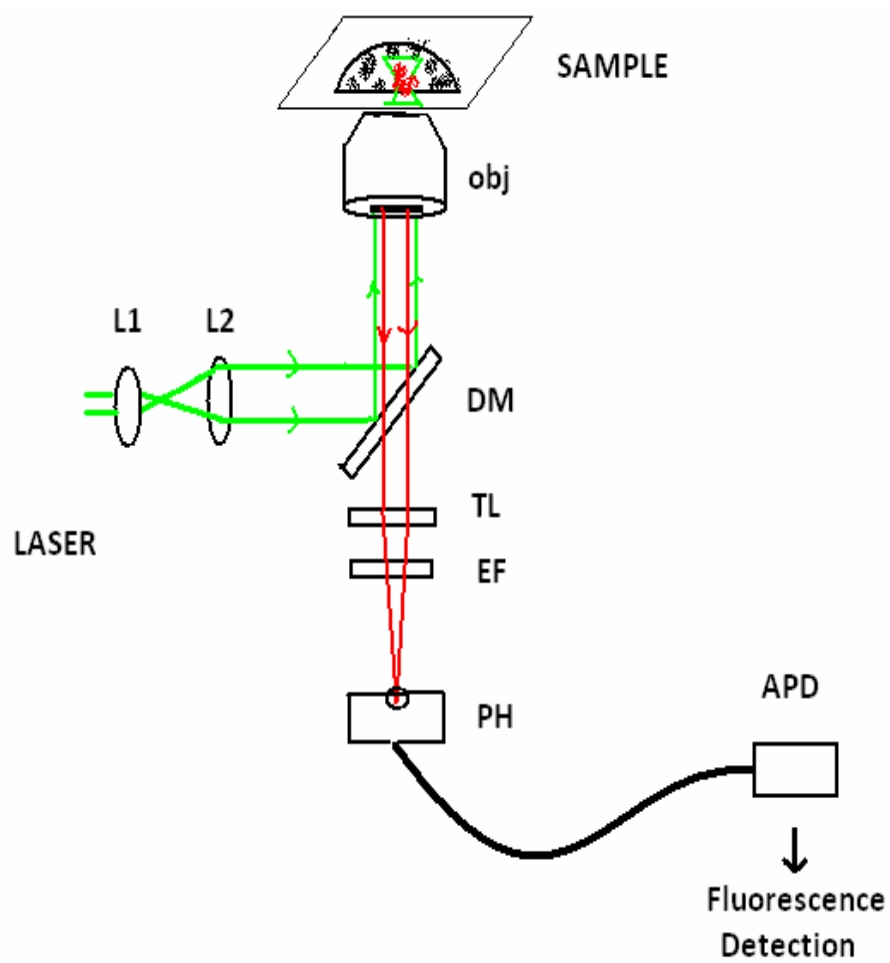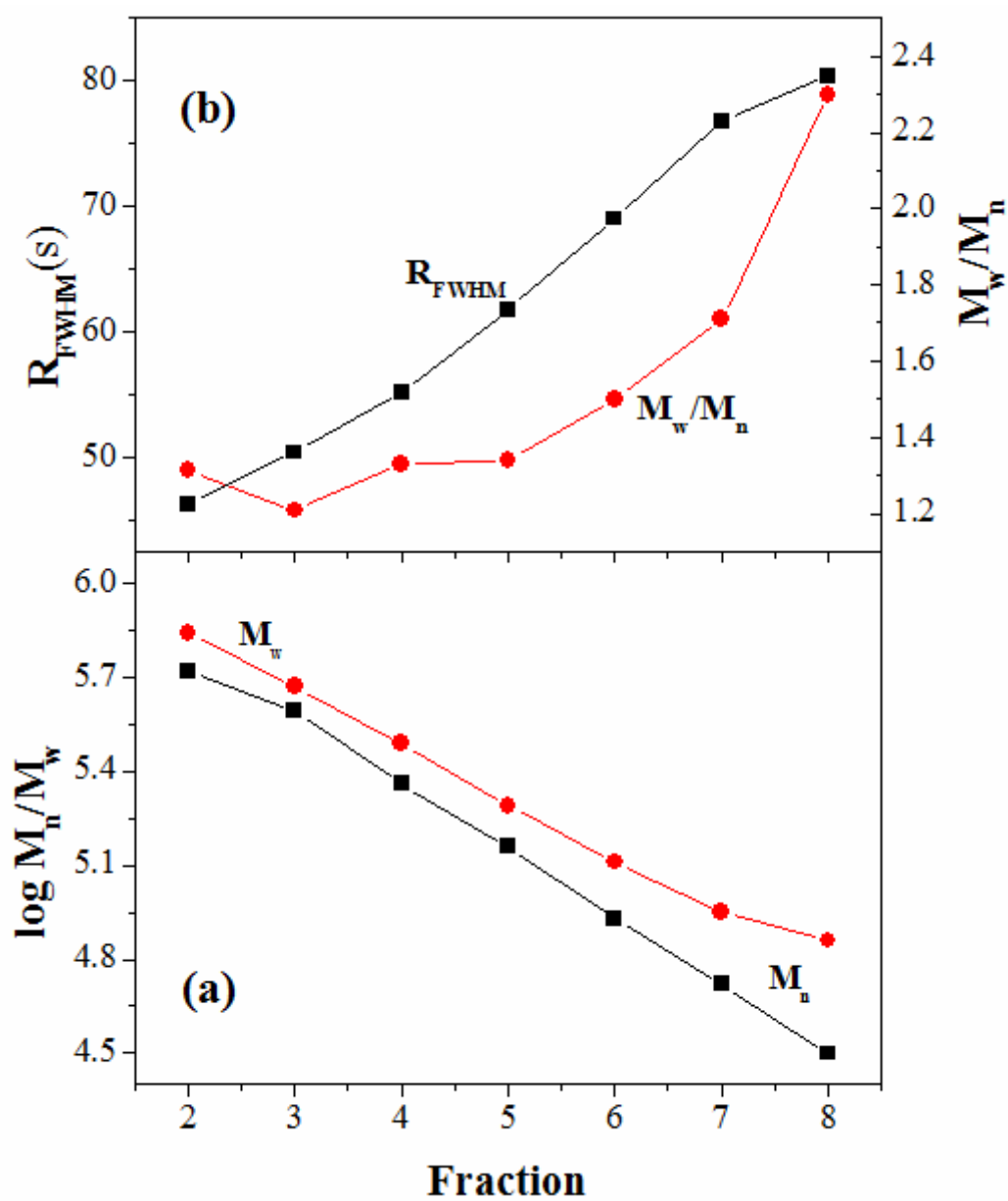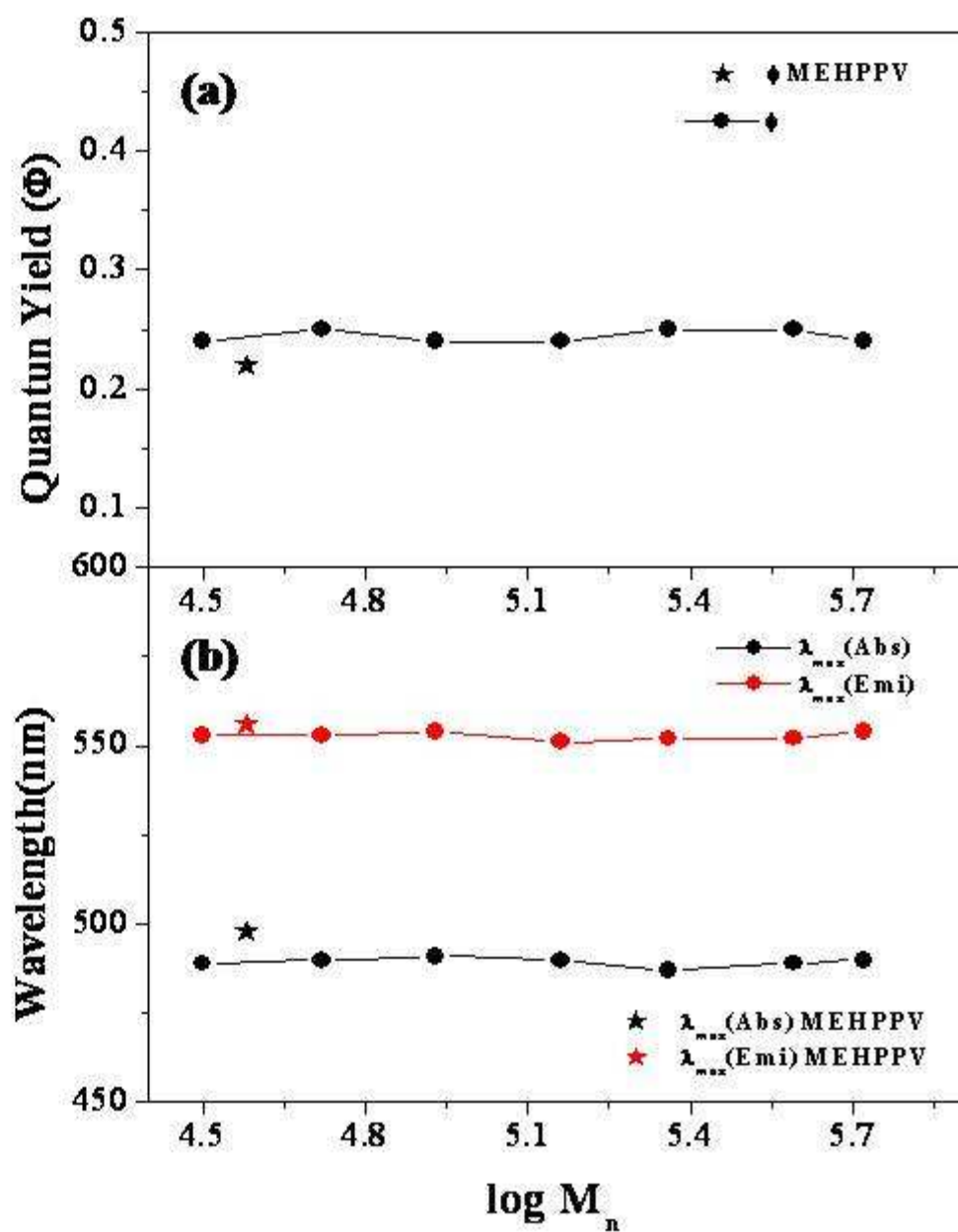[2] Corresponding author: jayakannan@iiserpune.ac.in
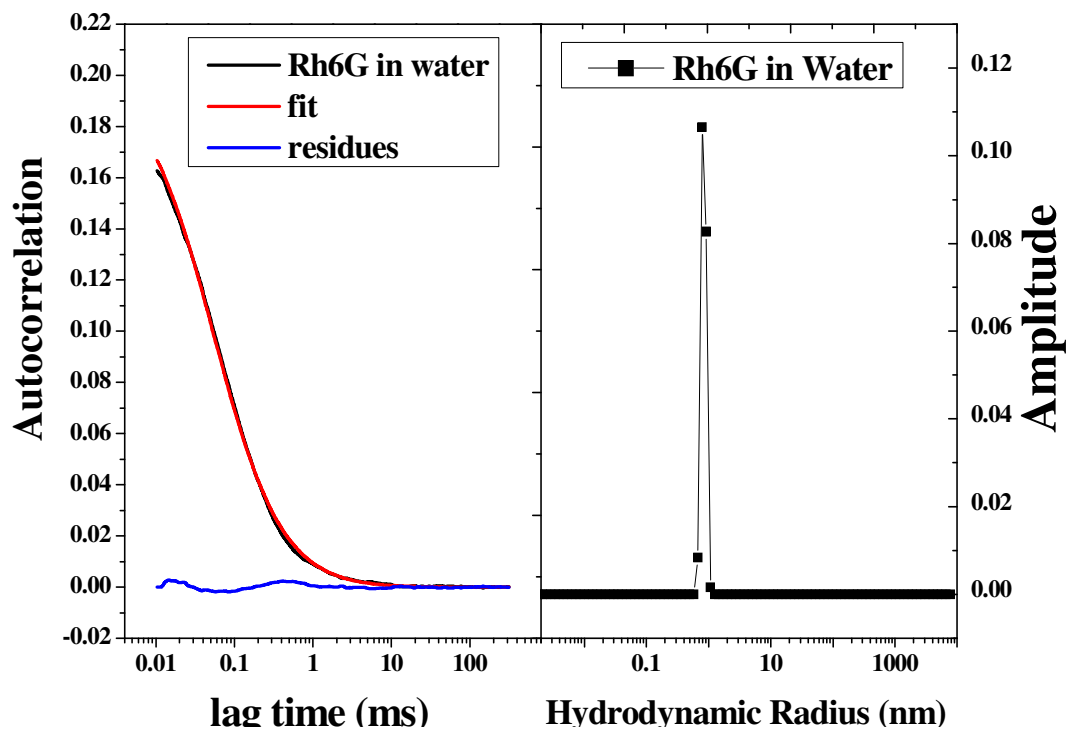
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Fig 1: Block Diagram of FCS Setup

Fig 2: Home built FCS Instrument

**Figure 3.** Plots of molecular weights Mn (a) and Mw(b) versus fractions numbers.

Figure 4. Plots of absorbance and emission maxima (c) and quantum yield (d) versus M_n. The values showed (*) in c and d are with respect to un-fractionated sample.

Figure 5: Autocorrelation curve of Rhodamine 6G in water.

Note: This is used for Callberation the FCS Setup. The FCS Focal Volume is found to be 0.265fL with a radial dimension r = 0.238μm. which is used in equation (3)
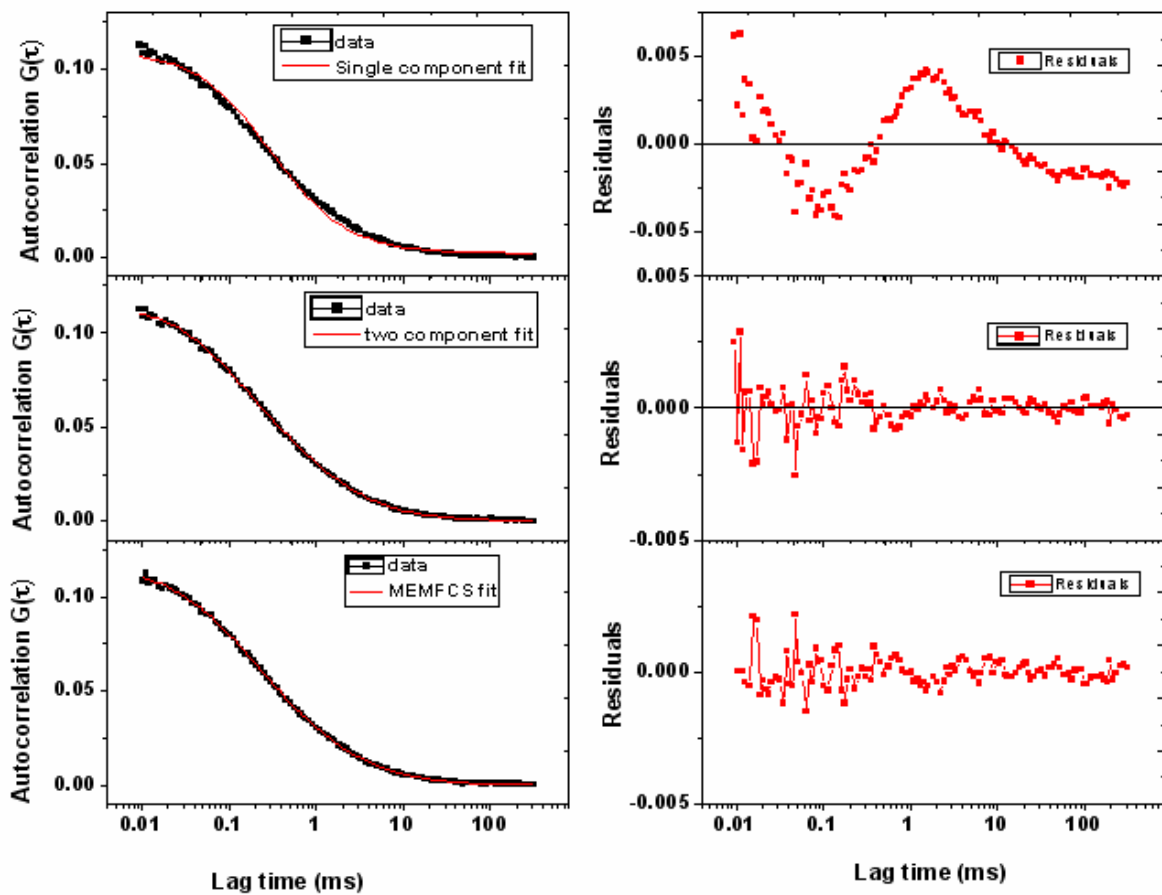
Figure 6. Different Fitting for FCS data with residues. It was observed that MEM program is fitting with less residues

<u>Note:</u> MEMFCS method gave good fitting with less residuals compared to other two methods

Table 1. FCS data for fraction for F-5

| Time Interval	Diffusion Time	Diffusion Coefficient($\mu m^2/s$)
100	0.191	74.5
300	0.167	85.2
500	0.246	57.8
700	0.216	65.8
900	0.147	96.8
Temperature($\circ$C)	Diffusion time (ms)	Diffusion Coefficient($\mu m^2/s$)
30	0.175	81.3
40	0.175	81.3
50	0.341	41.3
60	0.341	41.3
70	0.389	36.5
80	0.389	36.5
Concentration (nM)	Diffusion time (ms)	Diffusion Coefficient($\mu m^2/s$)
1	0.147	96.8
10	0.216	65.8
15	0.466	30.5
20	0.41	34.5
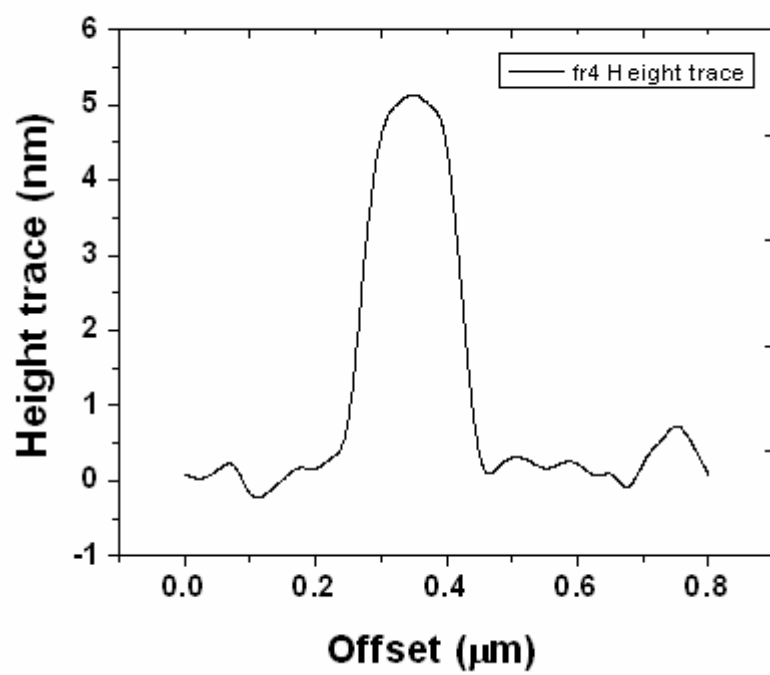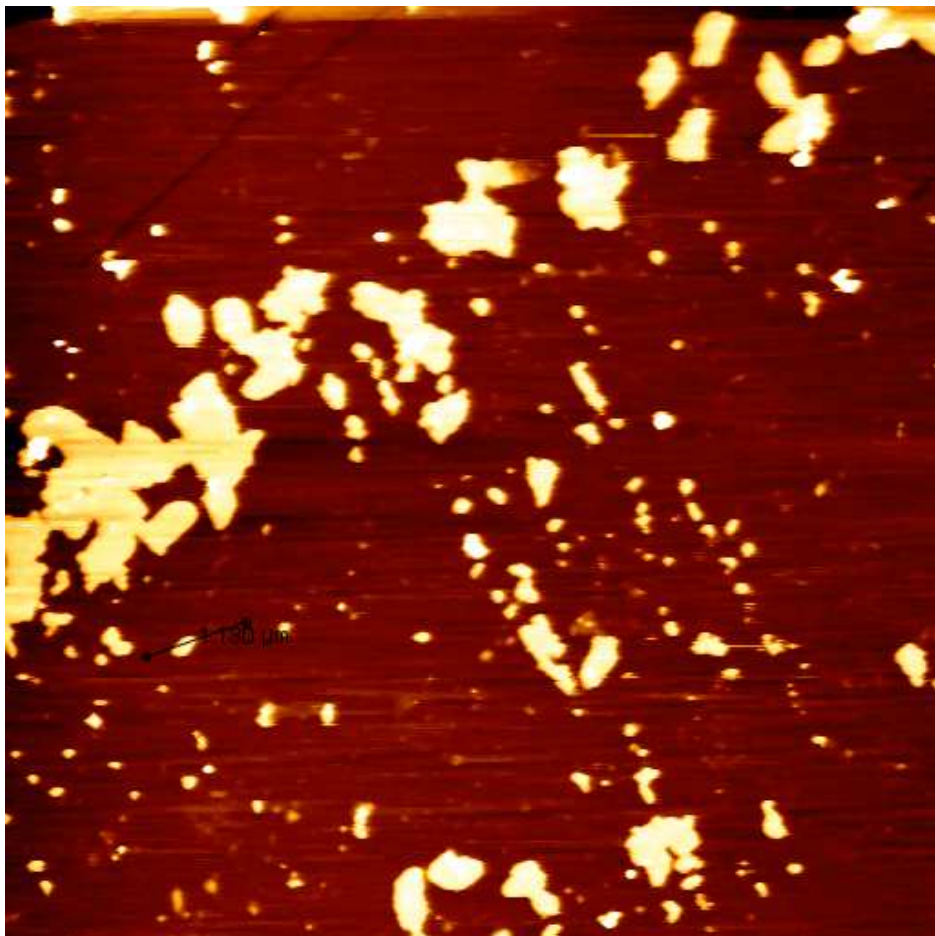
Figure 7. AFM image of fraction-4
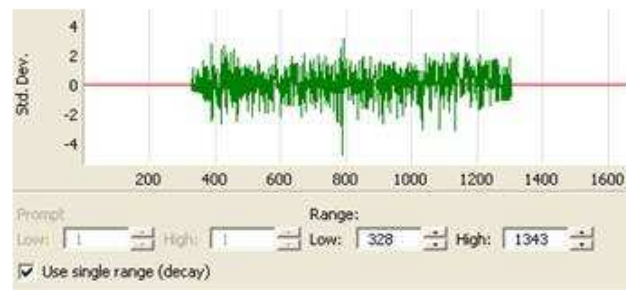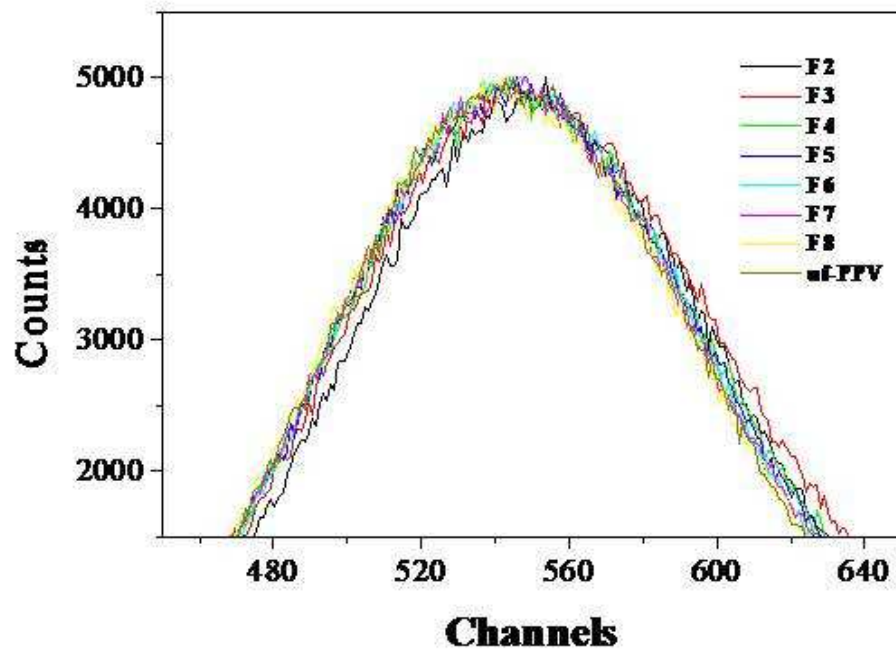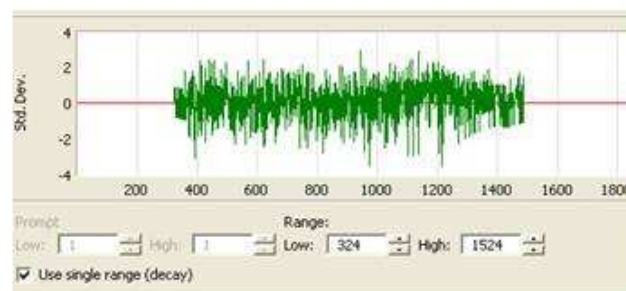
Figure 8: life time decay profiles of all the polymer samples

1-(2-ethylhexyloxy)-4-methoxybenzene

^{1}H-NMR

^{13}C-NMR

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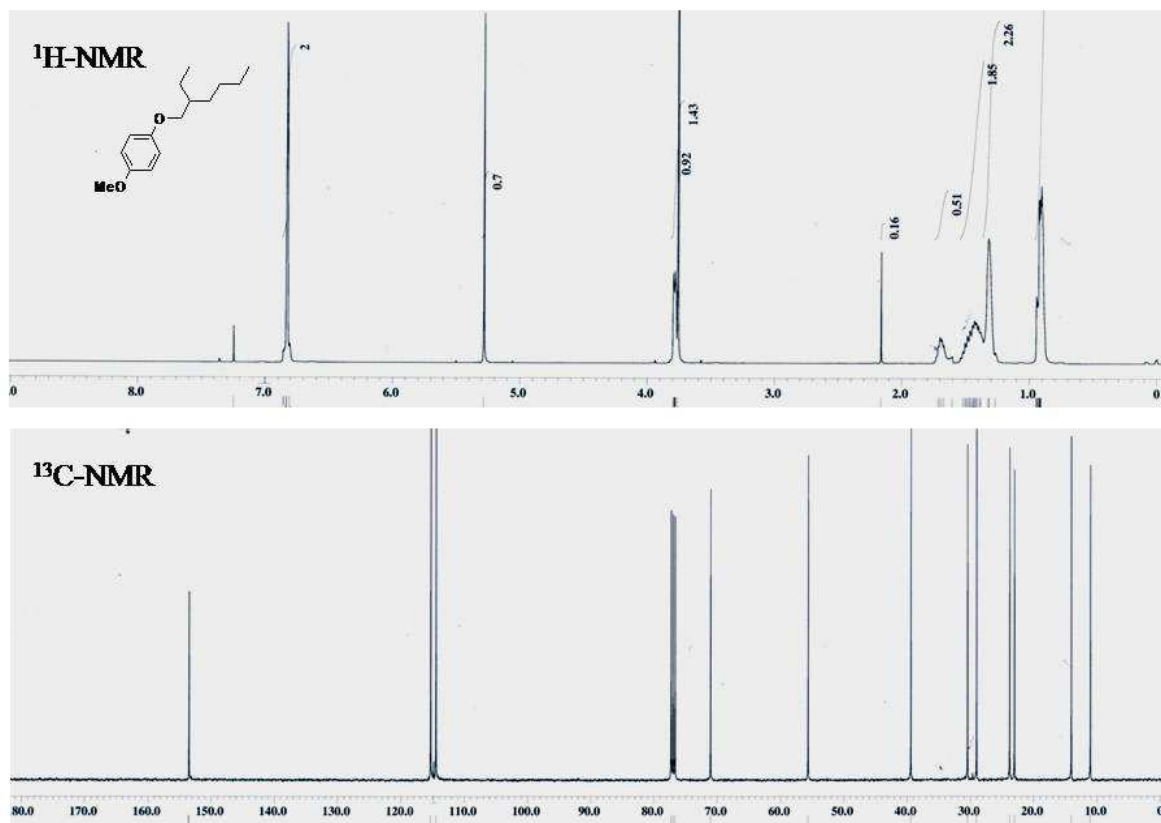
1, 4–bis (bromomethyl)–2–(2–ethylhexyloxy)–5–methoxybenzene

¹H-NMR

¹³C-NMR

MEH-PPV

¹H-NMR