Supporting Information

In Vitro Study of Glucose Attached Poly (Aryl Ether) Dendron Based Gel as Drug carrier for a Local Anaesthetic

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Table of Contents **Page**

Experimental:

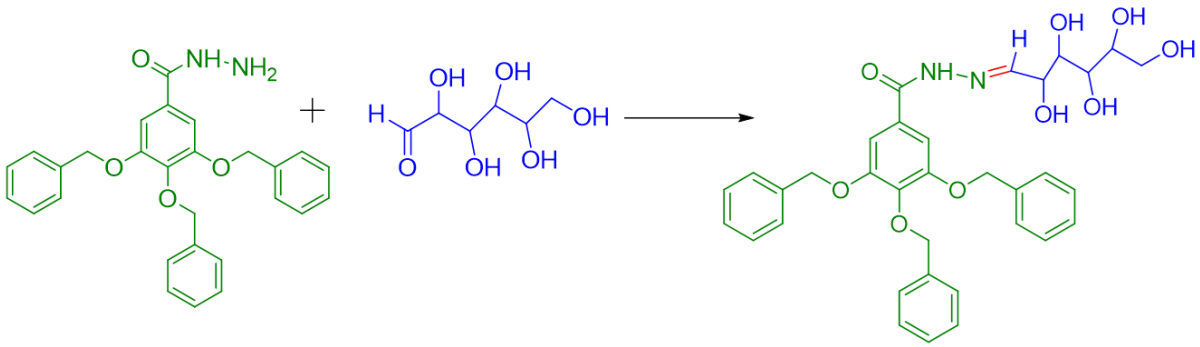
General information

^{1}H and ^{13}C NMR data were collected on a Bruker 500 MHz spectrometer. Mass spectra were recorded using Micromass Q-TOF mass spectrometer Voyager-DE PRO MALDI/TOF mass spectrometer with a-cyano-4-hydroxylcinnamic acid (CCA) as the matrix. The UV-Vis spectroscopic studies were carried out in JASCO V-660 Spectrophotometer. The scanning electron microscopic studies were carried out using a FEI-Quanta Microscope. The transmission electron microscopic images were taken using JEM3010JEO, operated at 200 kV. Powder- XRD patterns were recorded on a Bruker D8 Advance X-ray diffractometer using Cu-Kα radiation (λ = 1.54178 Å). Rheology experiments were carried out on an Anton-Paar Rheometer (MCR 102). MTT assay was measured in Bio Rad X-MARK microplate spectrophotometer and the optical and fluorescence images were measured in Olympus 1X51-Optica instrument.

Materials:

Gelator 1 has been synthesized by reported procedure,[1] and the alkyl terminated acyl hydrazides have been synthesized according to the literature procedure.[2] All the starting materials were obtained from Aldrich or Himedia. The used organic solvents were dried according to the standard procedures.

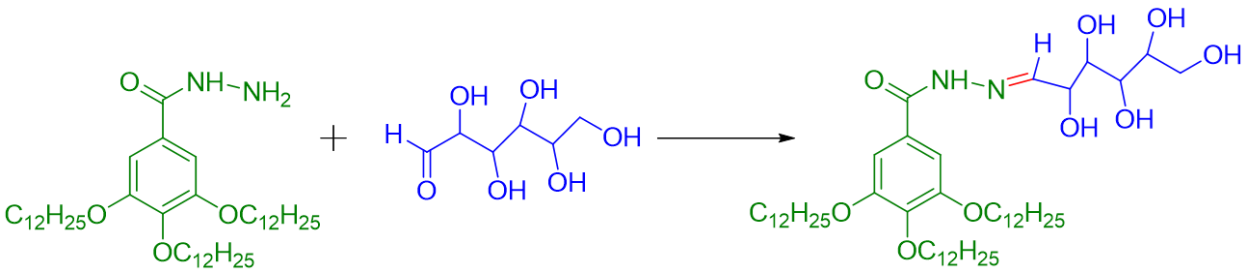
Experimental procedure for the synthesis of compound D1:



Scheme S1. Synthesis of compound **D1**

3, 4, 5-Tri aryl benzoic hydrazide (3 g, 0.0048 moles) and glucose (1.12 g, 0.0062 moles) was dissolved in 70ml $CHCl_3$-MeOH (1:3 v/v) mixture. The mixture was stirred at 65°C for 36 hours. The compound was purified by column chromatography using silica gel as the stationary phase and 10 % MeOH in $CHCl_3$ as the eluent to get the pure product as a white solid (3.5, 88%). **^{1}H NMR (500 MHz, DMSO-d6)**: 10.10(1H,s), 7.26-7.48(17H, m), 5.9(1H, s), 5.24(1H, s) , 5.177(4H, s) , 4.99(2H, s), 4.92 (2H, m), 4.3(1H, q) , 3.87(1H, d), 3.7(1H, m), 3.5(1H, m) , 3.4(1H, m), 3.2(1H, m) ,3.1(2H, m) **^{13}CNMR (125 MHz, DMSO-d6):** 60.8 , 69.10, 70.21, 71.75, 75.23, 76.66, 79.21, 90.23, 105.36, 126.56, 127.77, 129.34,135.56, 150.88,.165.98 ,**IR (KBr** cm^{-1}**)**: 3302,2897,1645,1581,1503,1455,1339 **HRMS (ES+)**: *m/z* Calcd for **$C_{34}H_{36}N_2O_9Na$:639.23** found: **639 [M+Na]+**.

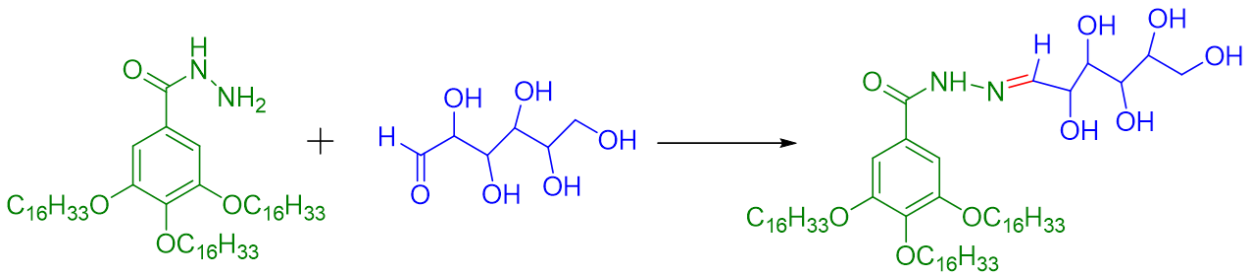
Experimental procedure for the synthesis of compound D2:



Scheme S2. Synthesis of compound **D2**

3, 4, 5-Tridodecyloxybenzoic hydrazide (4 g, 0.0046 moles) and glucose (1.2 g, 0.0057 moles) was dissolved in 50ml $CHCl_3$: MeOH (1:3 v/v) mixture. The mixture was stirred at 65°C for 36 hours. The compound was purified by column chromatography using silica gel as the stationary phase and 5% MeOH in $CHCl_3$ as the eluent to get the pure product as a white solid **(3 g, 61%)** **^{1}H NMR (500 MHz, CDCl3) δ:**9.22(1H, s), 6.95(1H, s), 5.92(1H, s), 5.70(1H, s), 5.39(1H, s), 4.98(1H, s), 4.0(2H, q),3.87(2H, t),3.79(4H,m),3.62(1H, s),3.49(1H, s), 3.28(1H, s),1.6-1.8 (6H, m),1.42 (2H, m), 1.35(4H, m), 1.25(52H, m),0.88(9H, t, J=6.3Hz); **^{13}C NMR (125 MHz, CDCl3) δ:** 14.14, 22.17, 25.9, 26.08, 26.18, 29.69, 30.25, 30.35, 31.95, 52.15, 68.88, 73.51, 73.66, 106.449, 107.960,109.39,124.66, 125.26, 149.16, 151.29,152.83,168.82,166.99 **IR (KBr** cm^{-1}**)**: 3396, 2921, 2852,1593, 1468 , 1358, 1239, 1117, 1024, 773, 720, **HRMS (ES+):** *m/z* Calcd for **$C_{49}H_{90}N_2O_9Na$: 873.65** found: **873.65 [M+Na]+.**

Experimental procedure for synthesis of D3



Scheme S3. Synthesis of compound **D3**

3,4,5-Tricetyloxybenzoic hydrazide (2 g, 0.0029 moles) and glucose (0.6288 g, 0.0034 moles) was dissolved in 50ml $CHCl_3$-MeOH (1:3 v/v) mixture. The mixture was stirred at 65°C for 36 hours. The compound was purified by column chromatography using silica gel as the stationary phase and 5% MeOH in $CHCl_3$ as the eluent to get the product as a white solid (1.5 g, 63%) **^{1}H NMR (500 MHz, CDCl3) δ:** 9.28(1H, s), 6.95(2H, s), 5.99(1H, s), 5.70(1H, s)5.44(1H, s), 4.98(1H, s), 4.04(2H, q),3.80(6H, d),3.62(1H, s),3.48(1H, s), 3.28(1H, s),1.68 (6H, s),1.42 (2H, m), 1.35(4H, m), 1.25(75H, m),0.88(9H, t, J=6.5Hz); **^{13}C NMR (125 MHz, CDCl3) δ :** 14.15, 22.72, 26.10, 29.40, 30.33, 31.96, 69.35, 73.55, 105.46, 127.47, 141.45, 153.25, 168.77**; IR (KBr Cm^{-1})** 3419, 2917, 2850, 1594, 1468,1383, 1351, 1121, 767, **MS (MALDI-TOF):** *m/z* Calcd for **$C_{61}H_{114}N_2O_9Na$**: **1042.85** and found: **1042.61 [M+Na]$^+$**

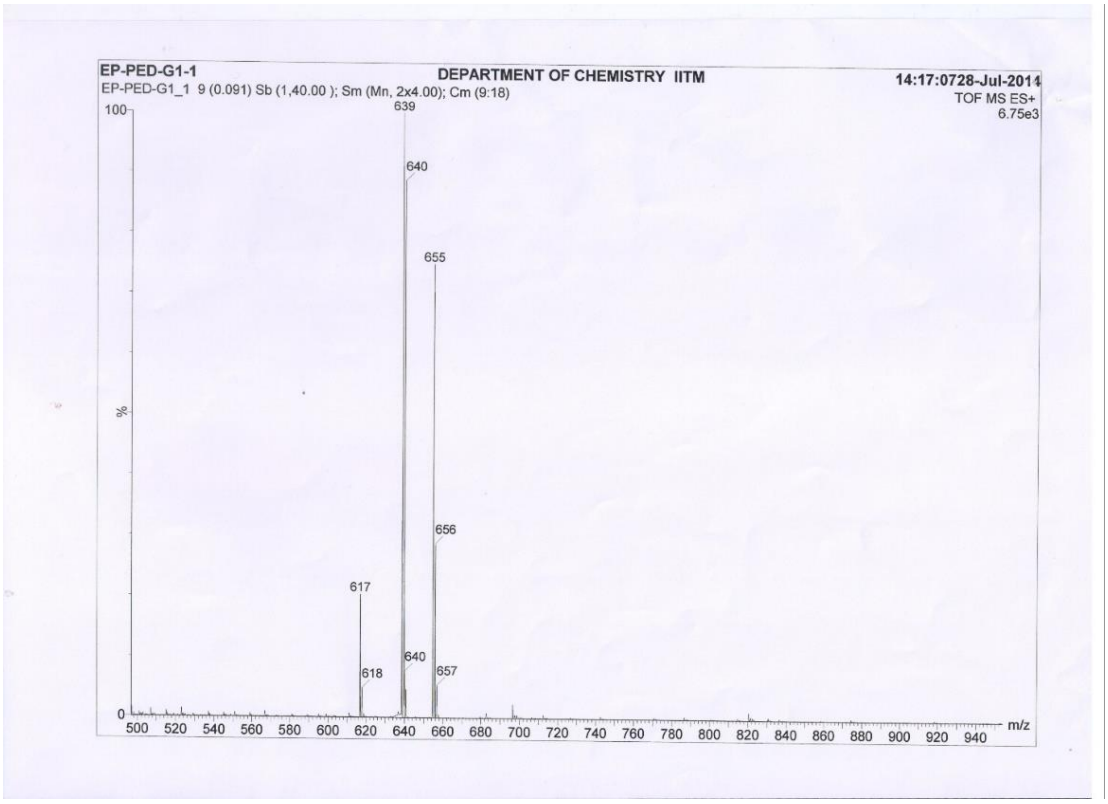


Figure S1. HRMS spectrum of **D1**

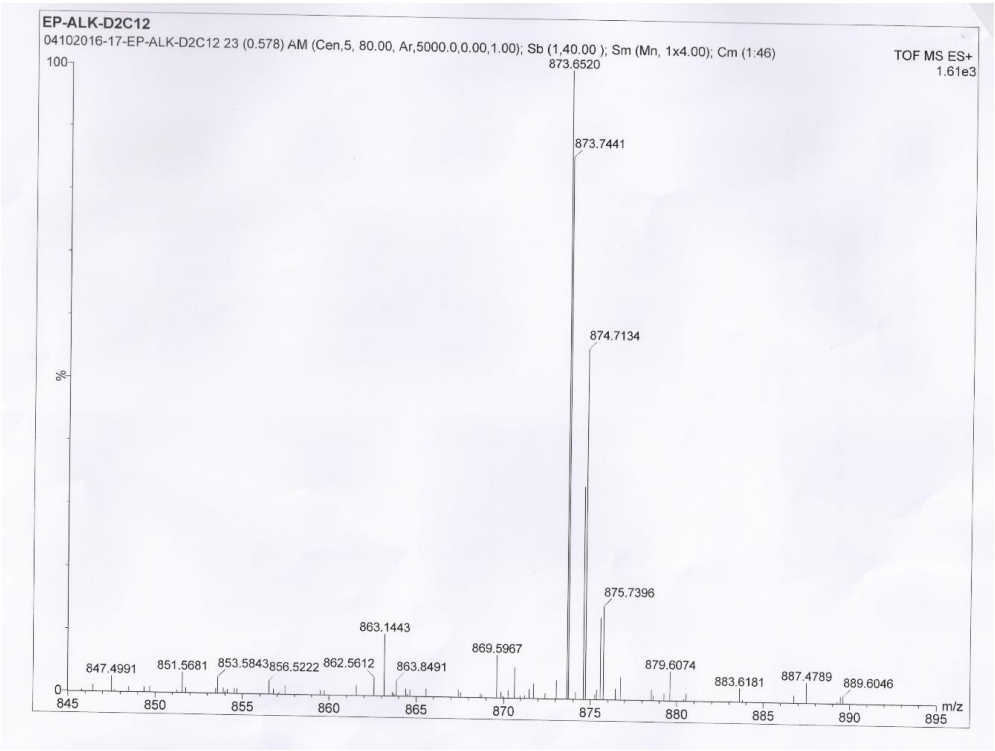


Figure S2. HRMS spectrum of **D2**

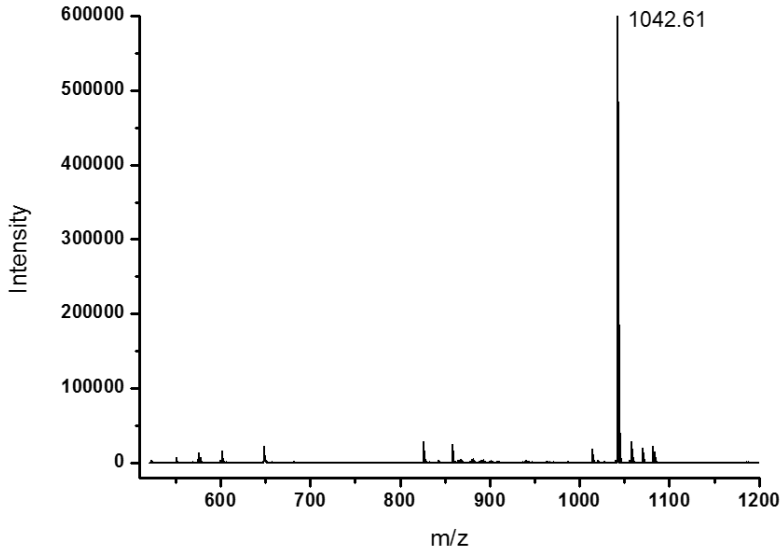


Figure S3. MALDI-TOF mass spectra of **D3**

Gelation: The newly synthesized dendritic **c**ompounds were tested for its gelation ability in different solvents and mixture of solvents. Compounds D2 and D3 formed an organogel in DMSO. The compound was heated to dissolve in DMSO and on cooling formed a gel with a cgc of 5mg/ml and 7mg/ml respectively.

Table S1: Gelation properties and critical gel concentrations (CGCs) of **D2** and **D3** in various organic solvents and mixture of solvents

Solvent	D2	D3
Chloroform	S	S
DCM	S	S
Hexane	S	S
Ethylacetate	S	P
Dimethyl sulfoxide	G - (5mg/ml)	G (7mg/ml)
Water	I	I
Toluene	P	P
Glycerol	P	P
Isopropanol	S	S

Ethylene glycol	**P**	**S**
Ethanol	**PS**	**PS**
Methanol	**PS**	**PS**
Acetonitrile	**P**	**S**
DMSO: Water	**P**	**P**
S = Sol, G = Gel, PS = Partially soluble , P = Precipitation.		

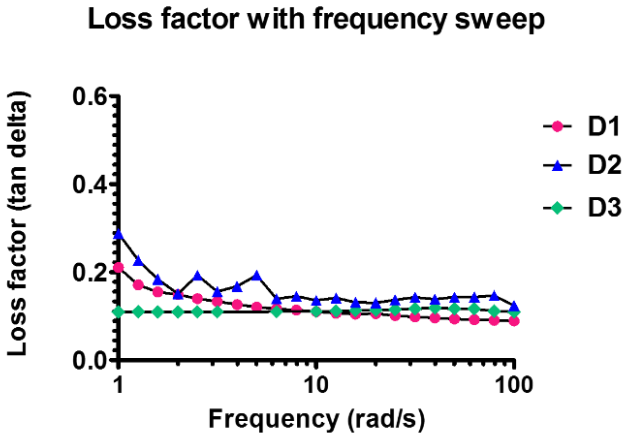


Figure S4: Tan delta vs frequency sweep of D1, D2 and D3 gels

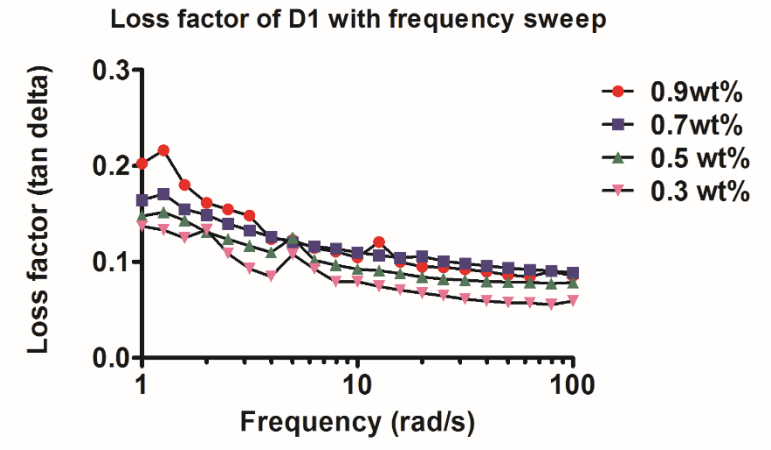


Figure S5: Tan delta vs frequency sweep of different **D1** gelator wt %

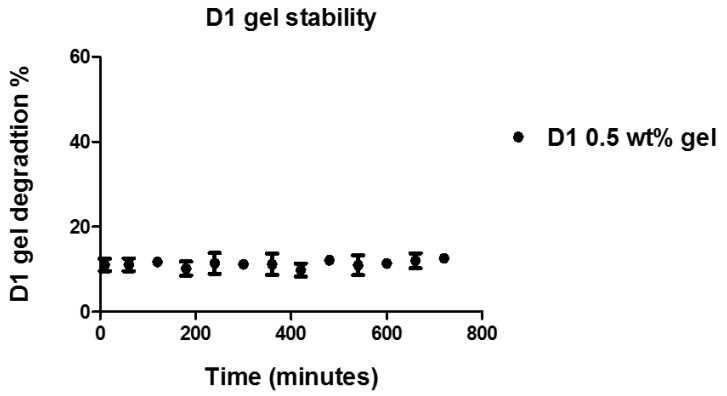


Figure S6: D1 gel stability in PBS

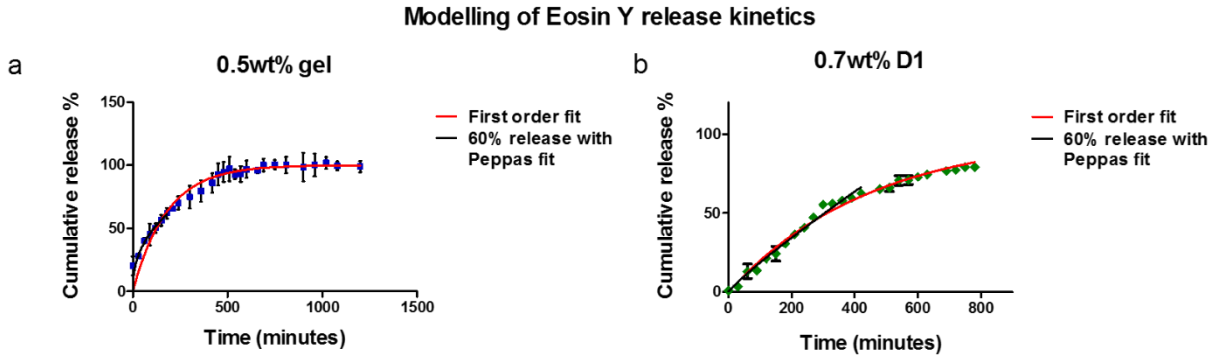


Figure S7: Cumulative release percentage of Eosin Y fitted with first order model and the Peppas model for a) 0.5wt % of D1 gelator and b) 0.7wt % of D1 gelator

Table S2: Results and the equation parameters for the release kinetic of Eosin Y dye at different gelator wt%

Gelator wt %	**Model**	**Equation**	***k* (t^{-n})**	**n**	R^2	**No of parameters**	$\overline{R^2}$
0.5wt% D1	First order	$Q_t = Q_0 e^{-kt}$	2.88 x 10^{-3}	-	0.985	1	0.984
	Peppas	$\frac{M_t}{M_\infty} = kt^n$	0.757	0.767	0.955	2	0.954
0.7wt% D1	First order	$Q_t = Q_0 e^{-kt}$	2.15 x 10^{-3}	-	0.985	1	0.985
	Peppas	$\frac{M_t}{M_\infty} = kt^n$	0.307	0.890	0.977	2	0.977

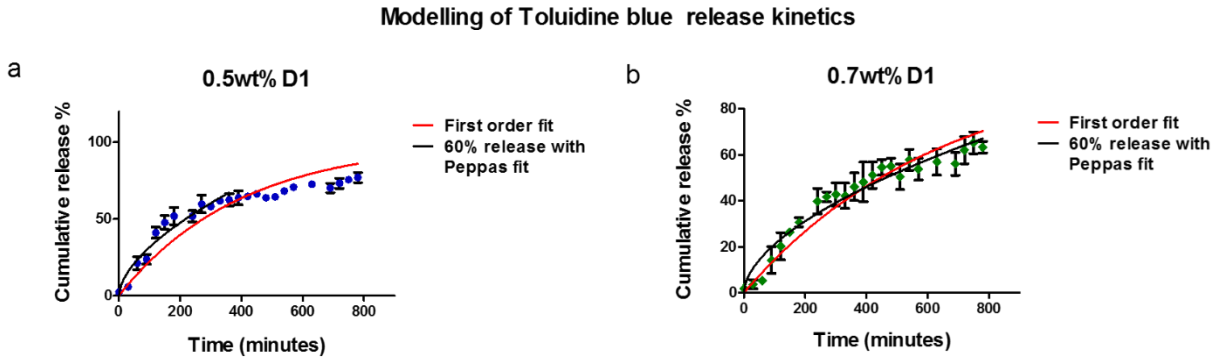


Figure S8: Cumulative release percentage of Toluidine blue fitted with first order model and the Peppas model for a) 0.5wt % of D1 gelator and b) 0.7wt % of D1 gelator

Table S3: Results and the equation parameters for the release kinetic of Toluidine blue dye at different gelator wt%

Gelator wt %	**Model**	**Equation**	***k* (t^{-n})**	**n**	R^2	**No of parameters**	$\overline{R^2}$
0.5wt% D1	First order	$\frac{Q_t}{} = Q_0 e^{-kt}$	2.52 x 10^{-3}	-	0.828	1	0.828
	Peppas	$\frac{M_t}{M_\infty} = kt^n$	2.091	0.5892	0.918	2	0.915
0.7wt% D1	First order	$\frac{Q_t}{} = Q_0 e^{-kt}$	1.5 x 10^{-3}	-	0.898	1	0.898
	Peppas	$\frac{M_t}{M_\infty} = kt^n$	1.568	0.5640	0.913	2	0.911

References:

(1) Rajamalli, P.; Sheet, P. S.; Prasad, E. *Chem. Commun. (Camb).* **2013**, *49*, 6758–6760.

(2) Zhang, X.; Li, M. *J. Mol. Struct.* **2008**, *892* , 490–494.