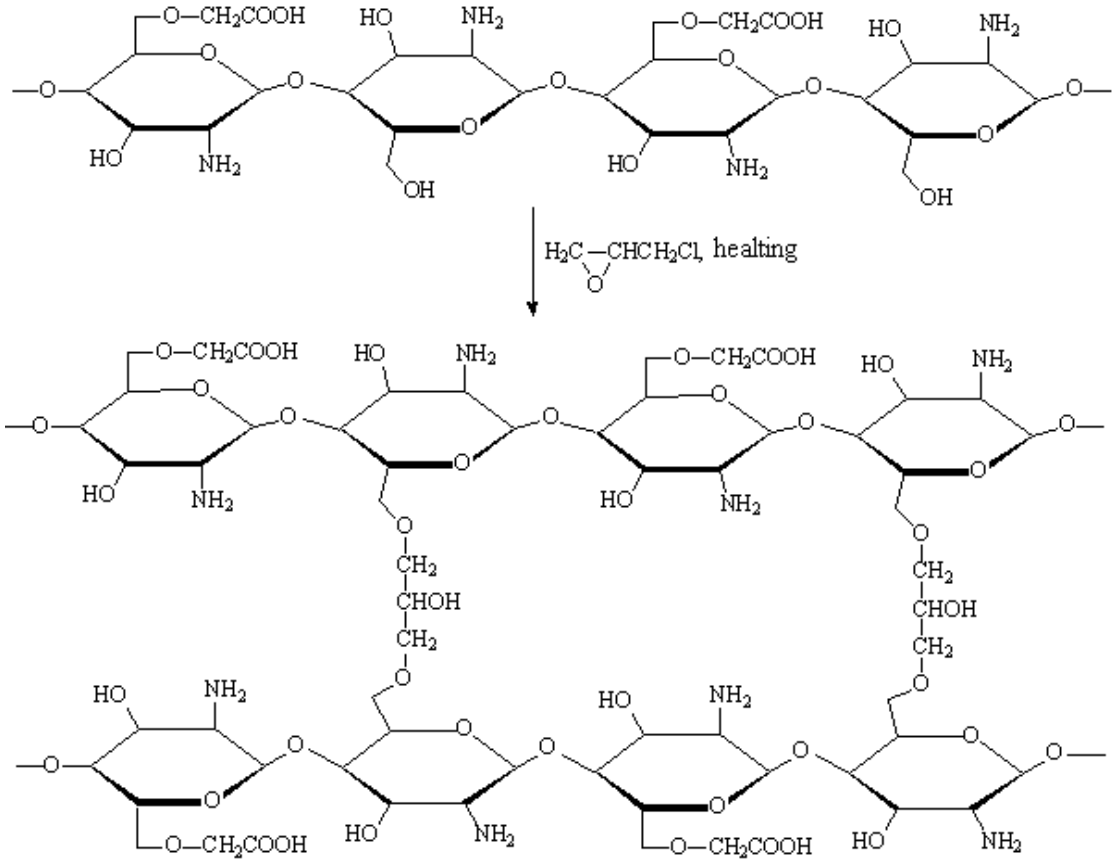
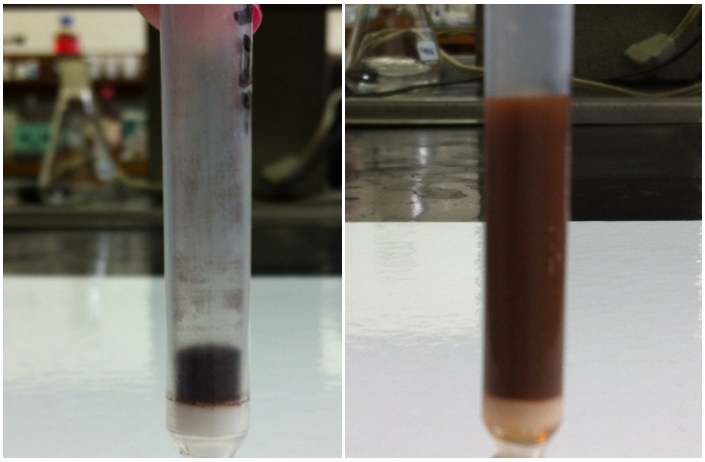
Electronic Supplementary Material (ESI) for Soft Matter.

Electronic Supplementary Information (ESI) available

A magnetic nanogel based on chitosan for antitumor drug delivery: Synthesis, characterization and in vitro drug release.



S1: Crosslinked reaction of O-carboxymethyl chitosan and epichlorohydrin.



a) b)

S2) Comparison of the swelling the images of the O-CEMg nonogel measured without (a) and with (b) the buffer solution pH 7.4; 100 mg of O-CEMg, contact time 60 min.

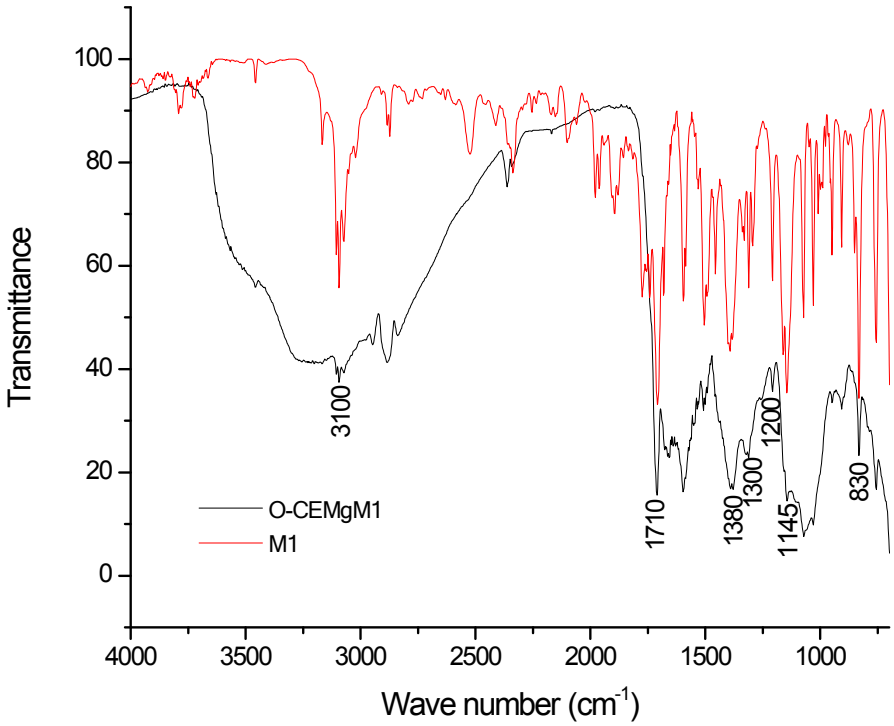


Figure S3: FTIR spectra of M1 loaded in magnetic hydrogel (O-CEMgM1)

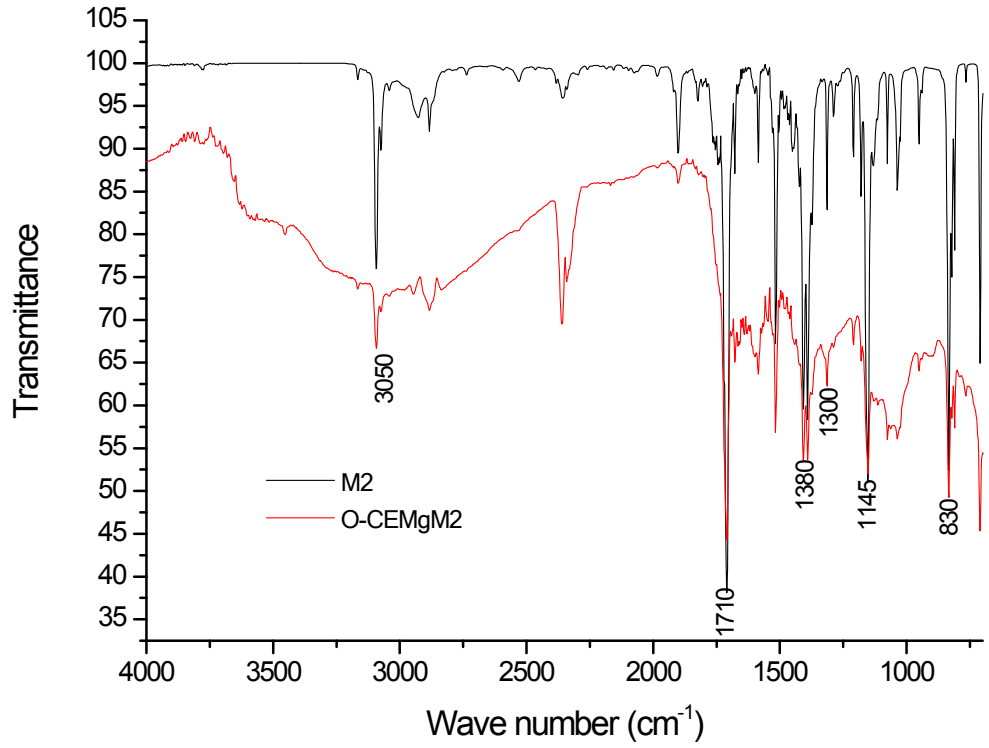


Figure S4: FTIR spectra of M2 loaded in magnetic hydrogel (O-CEMgM2)

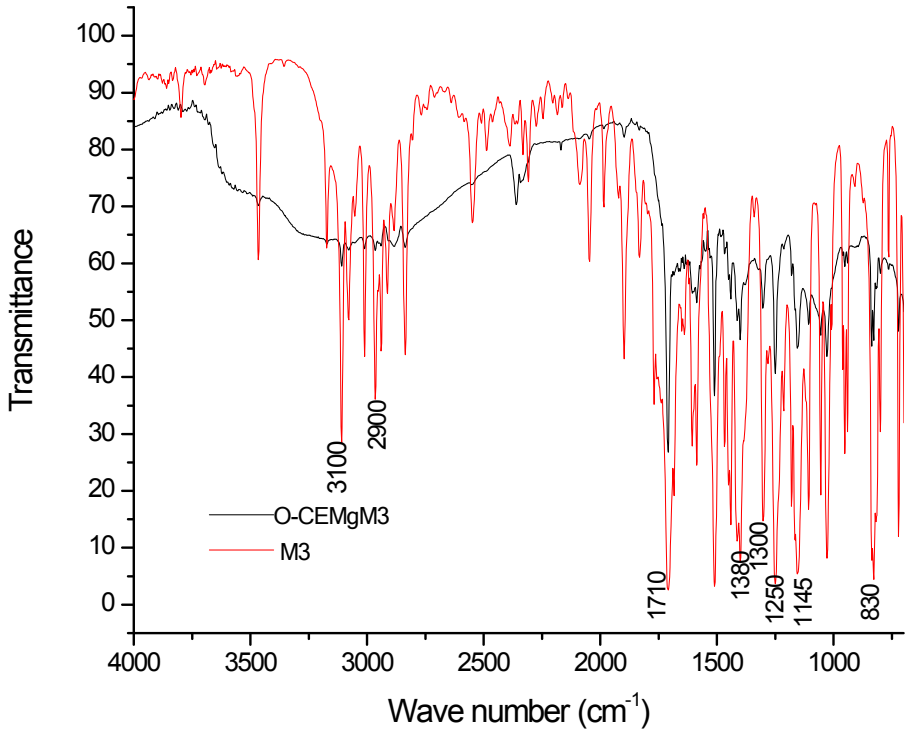


Figure S5: FTIR spectra of M3 loaded in magnetic hydrogel (O-CEMgM3)

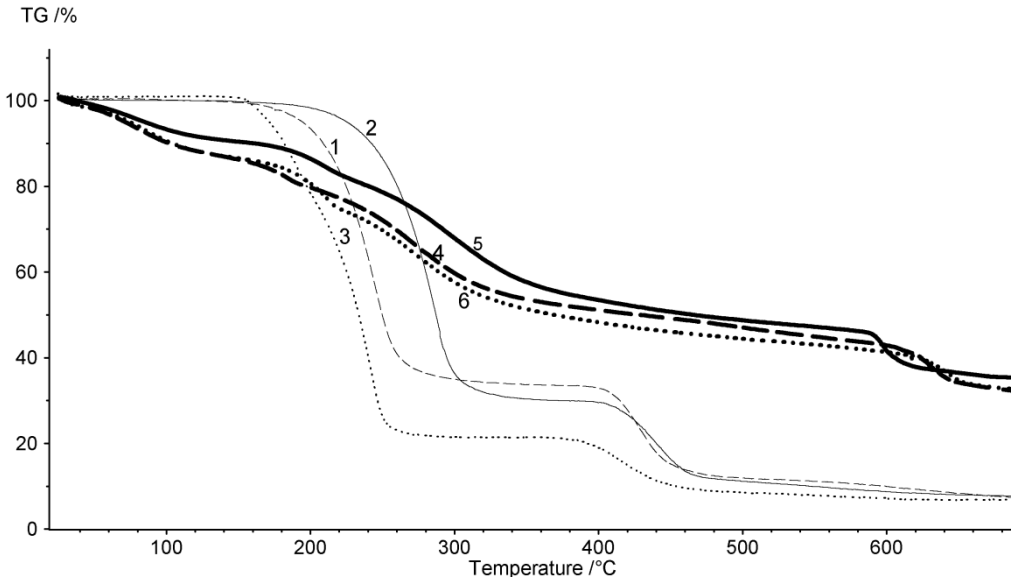


Figure S6: TG curves of M1 (1), M2 (2), M3 (3), O-CEMgM1 (4), O-CEMgM2 (5), O-CEMgM3 (6)

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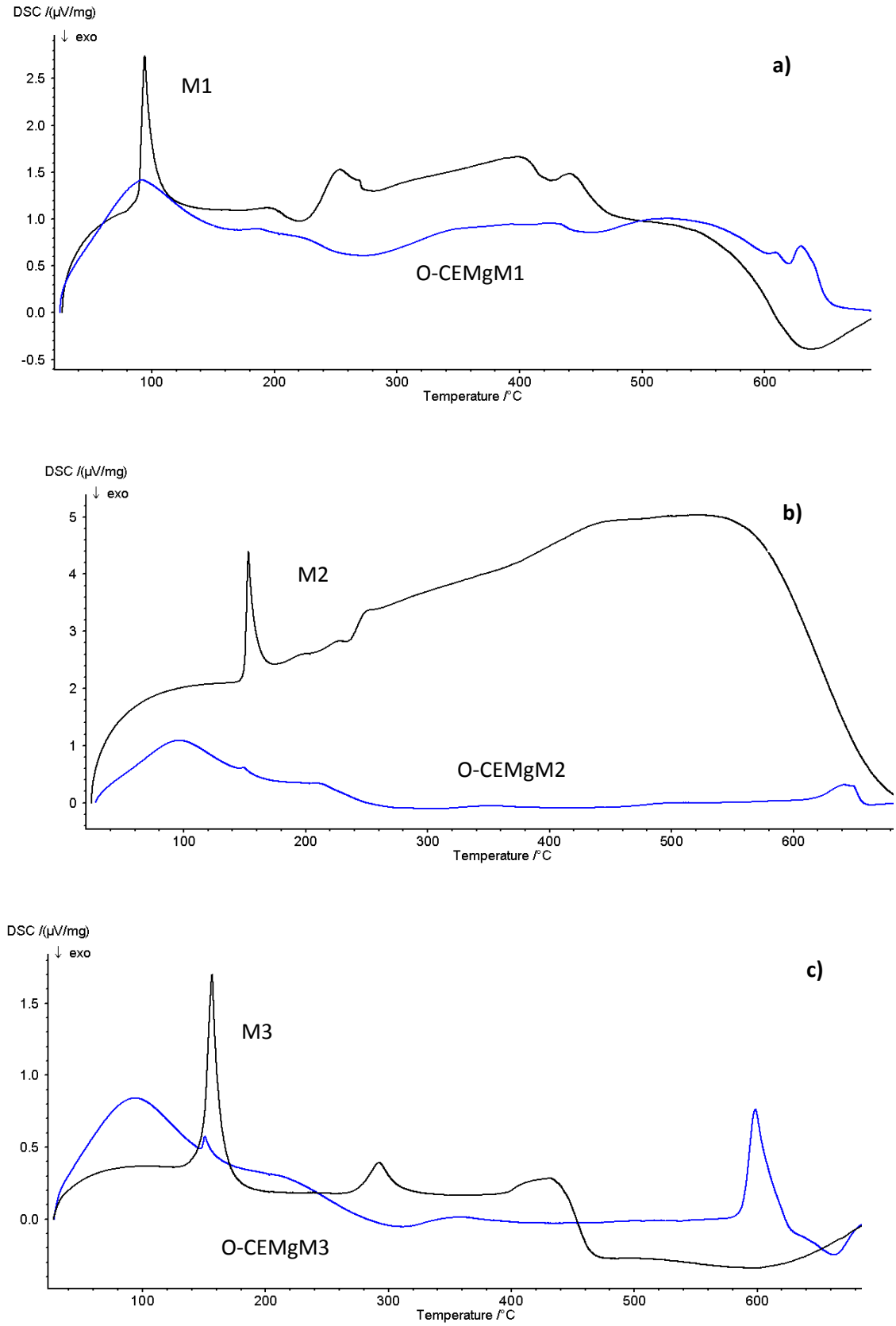

Figure S7: DSC curves of a) M1 and O-CEMgM1; b) M2 and O-CEMgM2; c) M3 and O-CEMgM3.

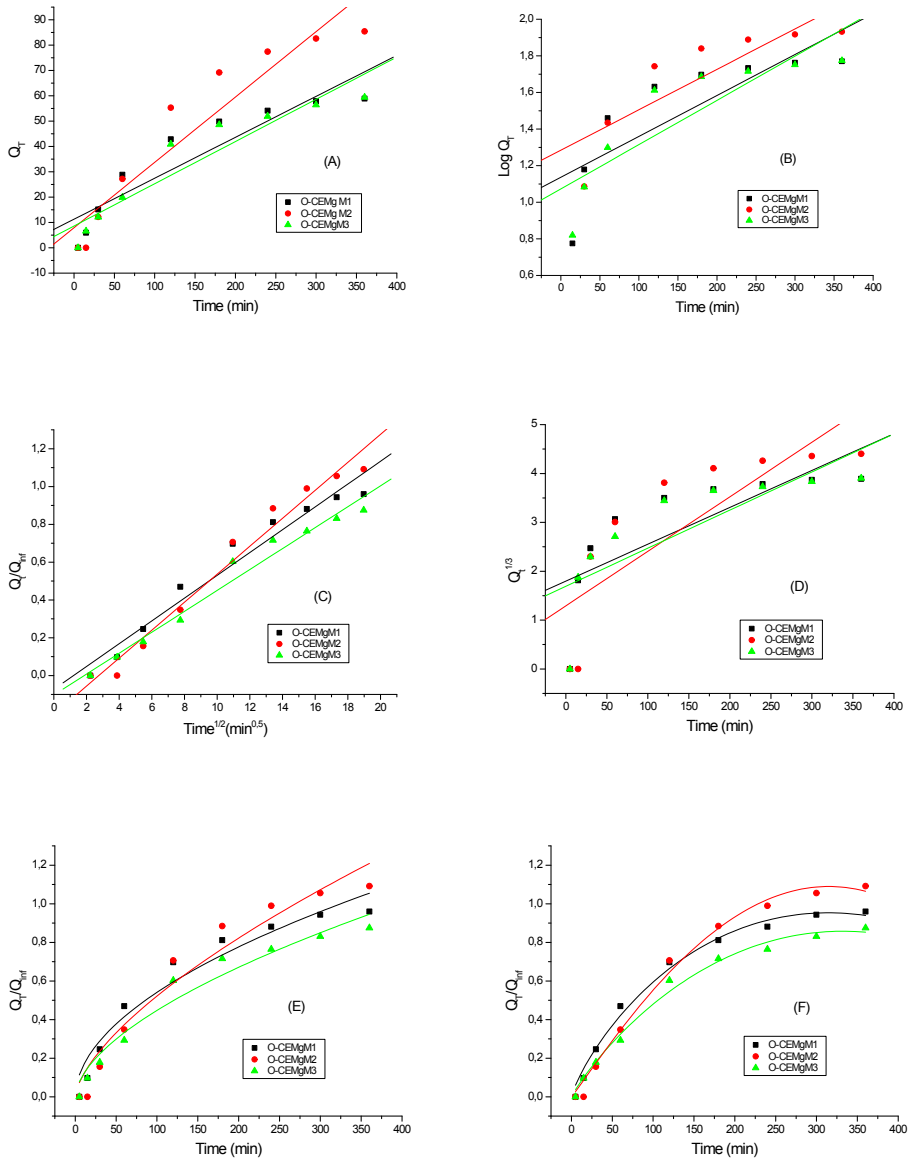

Figure S8: Mathematical models applied to maleimides release in phosphate buffer pH 5.0 to 37 ˚C of magnetic hydrogel. (A) Order zero, (B) first order (C) Higuchi, (D) Hixson-Crowell, (E)-Peppas and Korsmeyer (F) Peppas-Sahlin.

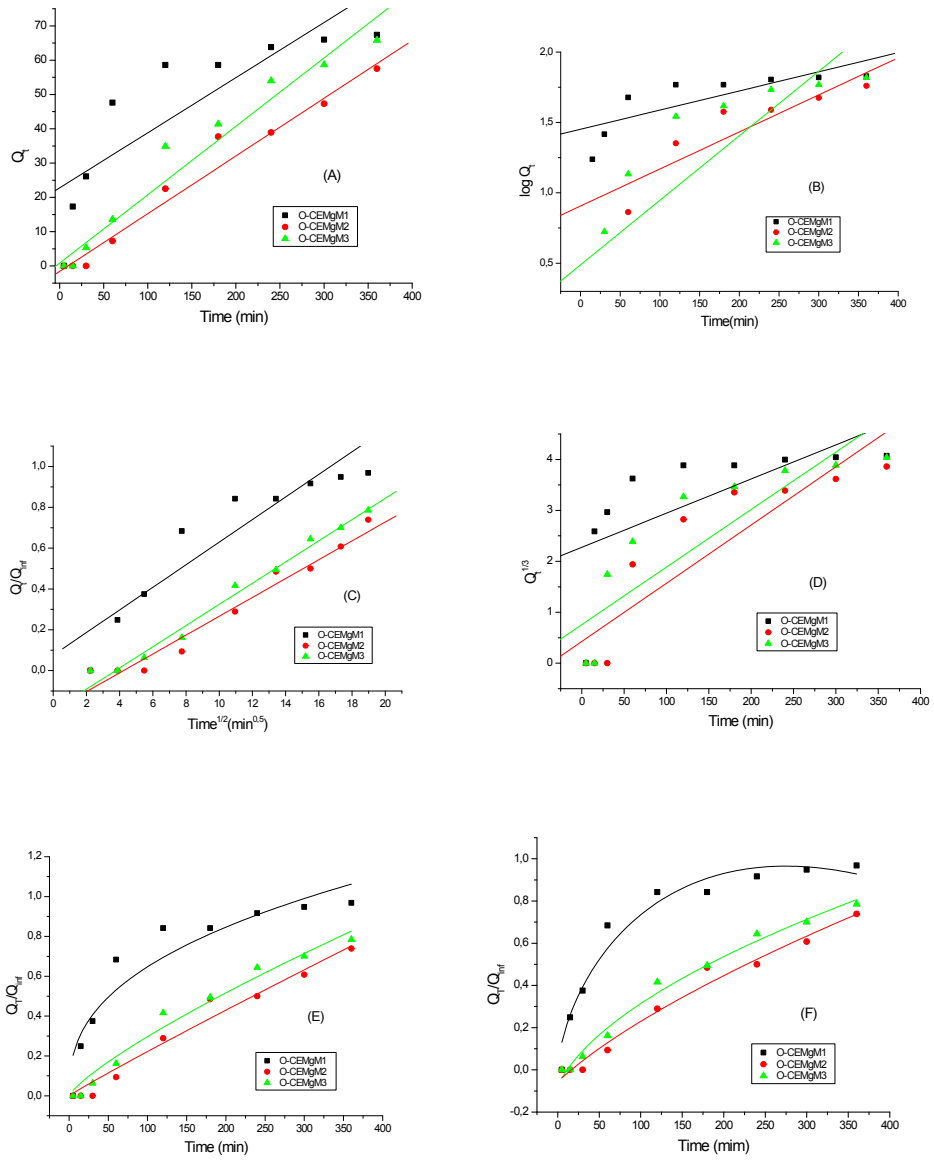

Figure S9: Mathematical models applied to maleimides release in phosphate buffer pH 7.4 to 37 ˚C of magnetic hydrogel. (A) Order zero, (B) first order (C) Higuchi, (D) Hixson-Crowell, (E)-Peppas and Korsmeyer (F) Peppas-Sahlin.

Table S10. Constant release and correlation coefficients of the mathematical equations applied in the release of the maleimides incorporated in the magnetic nanogel.

	Zero order		First order		Higuchi		Hixson-Crowell		Korsmeyer-Peppas			Peppas-Sahlin			
	r	K_0 (min^{-1})	r	K_1 (min^{-1})	r	K_H ($min^{-1/2}$)	r	K_{HC} ($min^{-1/3}$)	r	K (min^{-1})	n	r	K_1 (min^{-1})	K_2 (min^{-1})	m
						pH 5.0									
M1	0.9221	0.1616	0.8100	0.0022	0.9798	0.0603	0.7641	0.0075	0.9512	0.0491	0.5211	0.9900	0.0160	$-6.77x10^{-5}$	0.8305
M2	0.9477	0.2579	0.8566	0.0022	0.9866	0.0740	0.8176	0.0112	0.9515	0.0254	0.6561	0.9909	0.0050	$-5.78x10^{-6}$	1.0557
M3	0.9444	0.1667	0.8675	0.0024	0.9872	0.0553	0.7965	0.0078	0.9615	0.0304	0.5837	0.9913	0.0088	$-2.26x10^{-5}$	0.9082
						pH 7.4									
M1	0.8296	0.1607	0.7785	0.0013	0.9223	0.05537	0.6612	0.0067	0.8969	0.1091	0.3867	0.9603	0.0465	$-5.6x10^{-4}$	0.6633
M2	0.9936	0.1683	0.9127	0.0026	0.9838	0.04619	0.9048	0.0114	0.9718	0.0028	0.7518	0.9807	$7.1x10^{-4}$	$-1.7x10^{-7}$	1.2609
M3	0.9768	0.1995	0.7559	0.0046	0.9887	0.05196	0.8810	0.0113	0.9764	0.0075	0.7989	0.9909	0.0018	$-1.1x10^{-6}$	1.1335

Table S11: Release amount of maleimides (mg) from magnetic nanogel with and without application of magnetic fields, in phosphate buffer pH 5.0 and 37 °C after 360 min.

	without EMF	with EMF
O-CEMgM1	1.76	2.55
O-CEMgM2	1.87	2.70
O-CEMgM3	2.61	2.79

Table S12: Constants release and correlation coefficients of the Korsmeyer-Peppas model applied in the release of the maleimides incorporated in the magnetic nanogel, in phosphate buffer pH 5.0, 37 ˚C.

	r	K (min^{-1})	n
O-CEMgM1	0.9206	0.1274	0.3725
O-CEMgM2	0.9260	0.0453	0.5633
O-CEMgM3	0.9789	0.0791	0.4578