Electronic Supplementary Information

O. Goncharuk, Yu. Samchenko, L. Kernosenko, et al. **Thermoresponsive hydrogels physically crosslinked with magnetically modified LAPONITE® nanoparticles.**
Soft Matter 2020; https://doi.org/10.1039/D0SM00929F

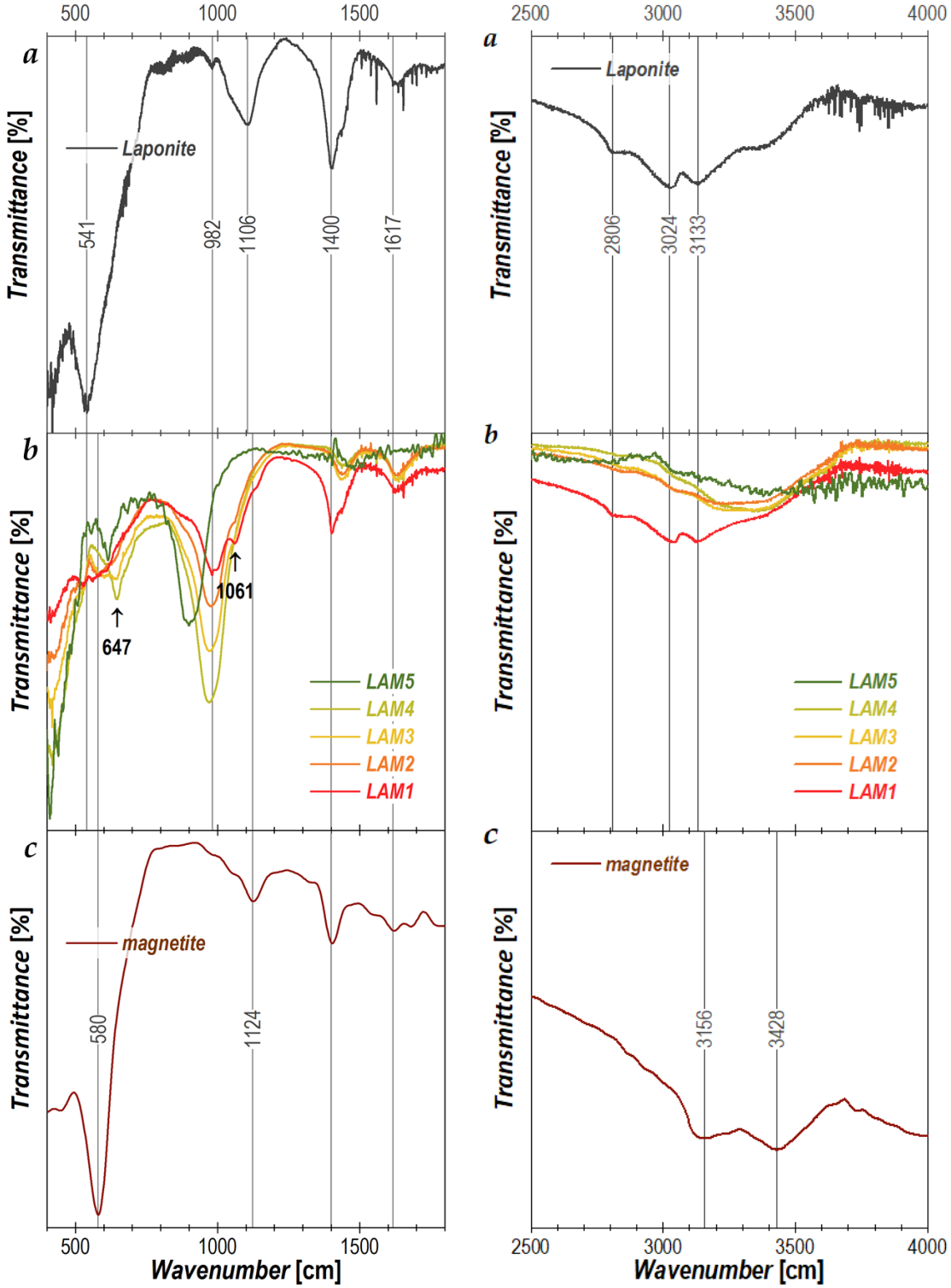

Fig. S1. *IR spectra (transmittance) of Laponite (a), LAM1–LAM5 (b), and magnetite (c) in 400-1750 cm^{-1} (left) and 2500-4000 cm^{-1} (b) wavenumber region.*

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Table SI. *Fitting parameters for temperature-depending swelling degree of polyNIPAAm hydrogel nanocomposites with incorporated Laponite and LAM nanoparticles.*

Sample	Inflection point C_0	Bottom asymptote, A_1 [g/g]	Top asymptote, A_2 [g/g]	Slope p [g/(g×T)]	$R^2_{adj.}$
polyNIPAAm/Laponite	28.8 ± 0.7	0.2 ± 0.4	10.9 ± 0.5	-0.14± 0.04	0.98483
polyNIPAAm/LAM5	30.7 ± 0.7	0.2 ± 0.9	14.3 ± 1.2	-0.22 ± 0.07	0.95390
polyNIPAAm/LAM4	29.3 ± 1.2	0.2 ± 2.0	24.9 ± 2.4	-0.15 ± 0.08	0.93441
polyNIPAAm/LAM3	29.3 ± 0.7	0.1 ± 1.1	22.1 ± 1.5	-0.19 ± 0.06	0.97047
polyNIPAAm/LAM2	29.5 ± 0.9	-0.2 ± 1.8	27.5 ± 2.3	-0.18 ± 0.07	0.95533
polyNIPAAm/LAM1	30.4 ± 0.6	0 ± 1.3	26.2 ± 1.8	-0.24 ± 0.06	0.97090

Table SII. *Results of integration of the first derivative of fitted temperature-depending swelling degree of polyNIPAAm hydrogel nanocomposites with incorporated Laponite and LAM nanoparticles. The values are color-coded: minimal values are highlighted green, maximal – yellow; FWHM stands for full width at half maximum.*

Sample	Integration results for Q'–T curves			
	Q'_{max}	T at Q'_{max}	*Area*	*FWHM*
polyNIPAAm/Laponite	**-0.87**	28.8	10.6	10.7
polyNIPAAm/LAM5	**-1.80**	30.7	14.1	6.9
polyNIPAAm/LAM4	**-2.20**	29.3	24.7	9.9
polyNIPAAm/LAM3	**-2.40**	29.3	22.0	8.1
polyNIPAAm/LAM2	**-2.83**	29.6	27.6	8.6
polyNIPAAm/LAM1	**-3.60**	30.4	26.2	6.4

Table SIII. *Low critical solution temperature (LCST), enthalpy of phase transition, and full width at half maximum (FWHM) determined from differential scanning calorimetry of polyNIPAAm hydrogel nanocomposites with incorporated Laponite and LAM nanoparticles.*

Sample	*LCST* [°C]		ΔH_{VPT} [mJ/(g×K)]	*FWHM* [°C]
	onset	peak		
polyNIPAAm/LAM1	33.1	35.5	624.3	3.7
polyNIPAAm/LAM2	33.1	36.0	857.0	5.9
polyNIPAAm/LAM3	33.2	37.4	825.3	6.0
polyNIPAAm/LAM4	32.9	35.5	694.3	3.4
polyNIPAAm/LAM5	33.4	35.5	899.6	5.2

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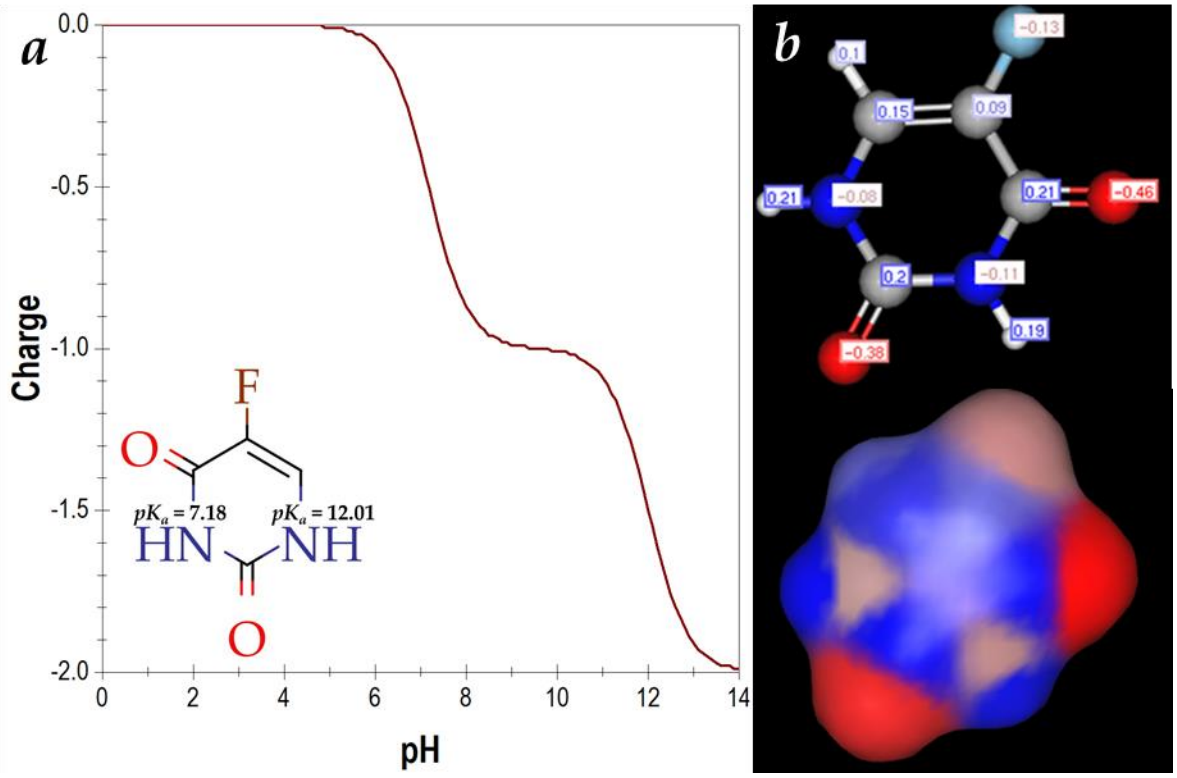

Fig. S2. *Dependence of net charge of 5-fluorouracil on pH (a) and charge distribution in molecule at pH 5.7 (b). The insert is a chemical structure of 5-fluorouracil with two pK_a values.*

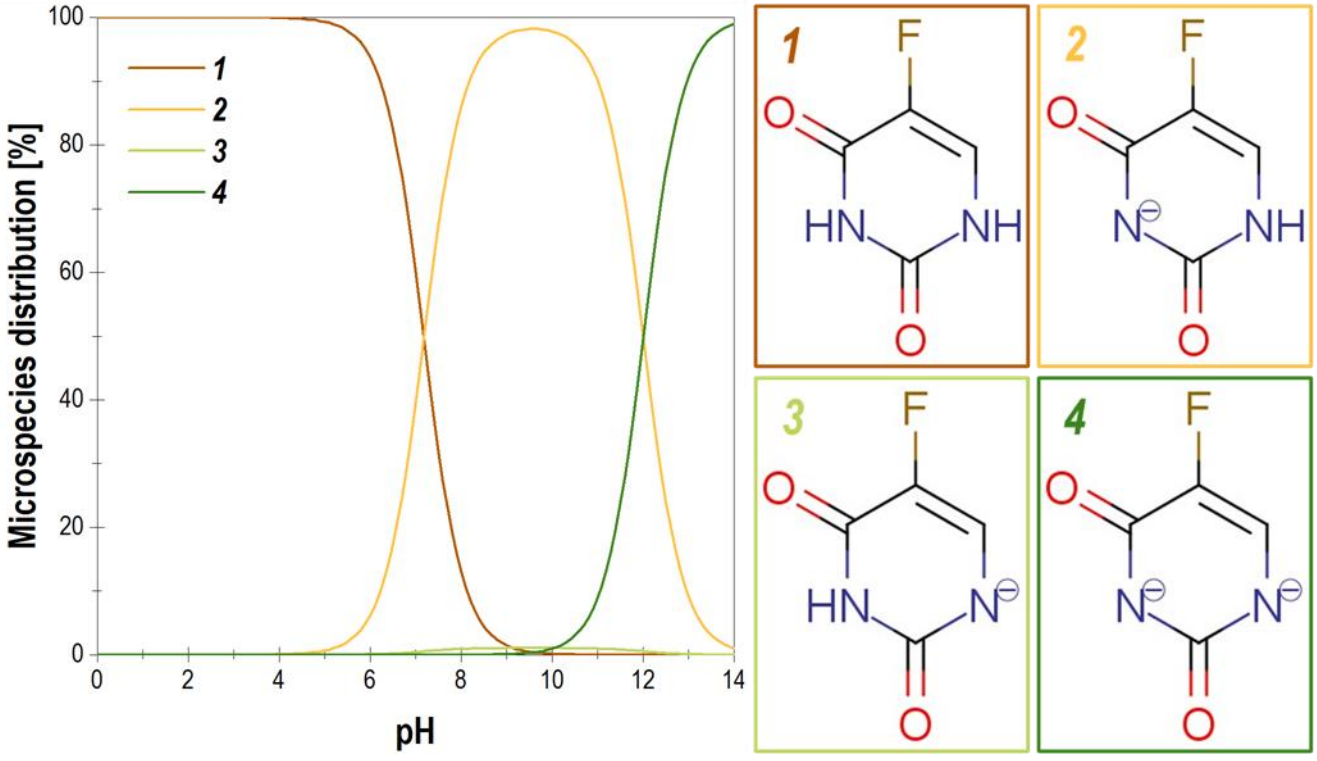

Fig. S3. *Major microspecies distribution of 5-fluorouracil based on pH.*

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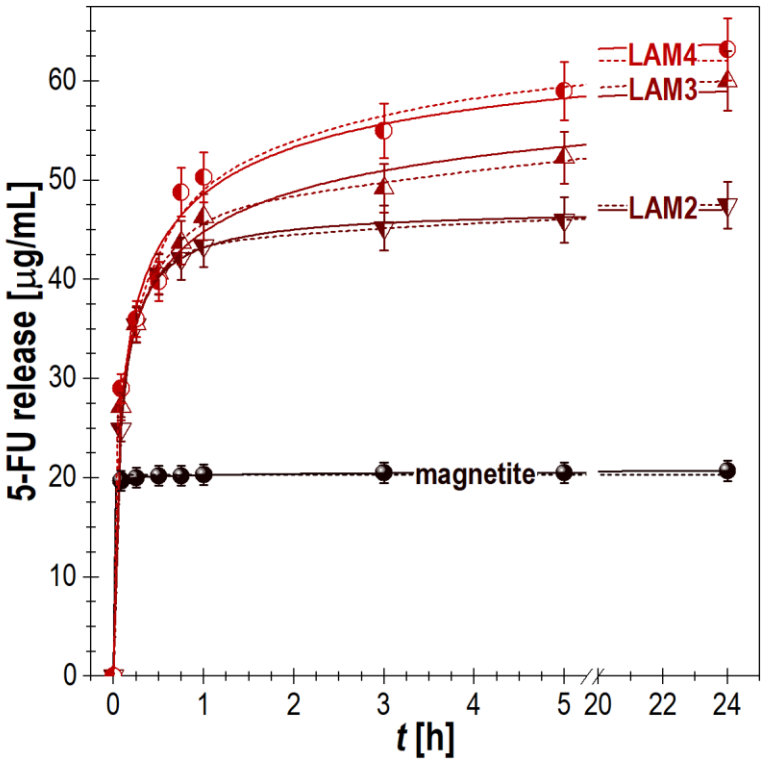

***Fig. S4. K**inetics of 5-fluorouracil release (b) from magnetite (solid symbols) and LAM nanoparticles (half-filled symbols) with different magnetite-to-Laponite weight ratios: LAM2 (downward triangles), 1:1; LAM3, 1:2 (upward triangles); and LAM4 (circles), 1:4. The release kinetics was fitted to the to the power (solid lines. eq. 1) and to the exponential (dash line, eq. 2) equations.*

Equations used for fitting the experimental data:

$$R = R_{max}\frac{t^n}{k^n + t^n}, \quad (1)$$

$$R = R_{max} + R_1 e^{-t/k_1} + R_2 e^{-t/k_2} + R_3 e^{-t/k_3} \quad (2)$$

where R_{max} is the equilibrium amount of released drug;

k, n, R_1, R_2, R_3, k_1, k_2, and k_3 are the fitting parameters.