

## \_bSupporting information

# How the crosslinker amount influences the final properties of HEMA Cryogels.

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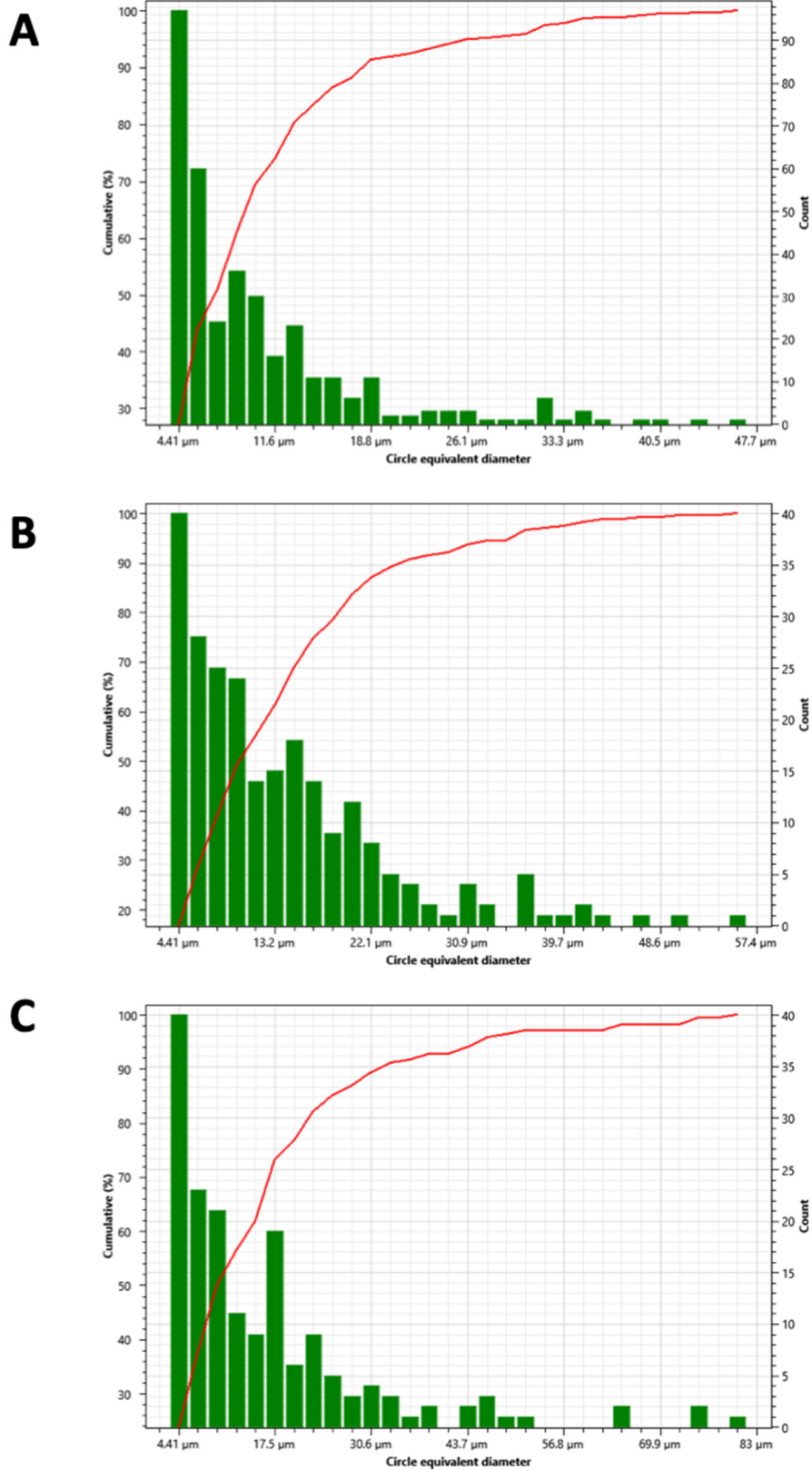
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Table S1. Cryogel's washing parameters

CYCLE N°	WASHING SOLUTION	METHOD
1 <sup>st</sup>	33 mL H <sub>2</sub> O	Directed percolation
2 <sup>nd</sup>	33 mL H <sub>2</sub> O-EtOH 50:50	Directed percolation
3 <sup>rd</sup> – 4 <sup>th</sup>	H <sub>2</sub> O-EtOH 25:75	Immersion
5 <sup>th</sup> - 6 <sup>th</sup> - 7 <sup>th</sup>	EtOH	Immersion
8 <sup>th</sup>	EtOH- Et <sub>2</sub> O 50:50	Immersion
9 <sup>th</sup> – 10 <sup>th</sup> – 11 <sup>th</sup>	Et <sub>2</sub> O	Immersion

Table S2. Average pore properties calculated on 5 images for each cryogel samples: (A) 1:5; (B) 1:6; (C) 1:7.

<b>SAMPLE</b>	<b>A</b>		<b>B</b>		<b>C</b>	
Pore Tot. Number	393		238		168	
Av Pore Area Ratio	39,34%		31,10%		46,12	
	<b>Median</b>	<b>Average</b>	<b>Median</b>	<b>Average</b>	<b>Median</b>	<b>Average</b>
Circle eq. diameter	9.09 µm	12.8 µm	11.8 µm	14.5 µm	12.3 µm	17.4 µm
Major axis	12.3 µm	18.4 µm	16.4 µm	20.7 µm	18.7 µm	25.5 µm
Minor axis	6.53 µm	9.36 µm	8.01 µm	10.7 µm	8.49 µm	12.7 µm
Circumference	31.7 µm	48.4 µm	41.1 µm	54.2 µm	46.4 µm	73.9 µm
Convex hull	31.7 µm	45.2 µm	39.8 µm	50.8 µm	45.4 µm	66.1 µm
Circum. circle diam.	12.7 µm	18.6 µm	16.2 µm	20.9 µm	18.9 µm	27.2 µm
Area	64.9 µm <sup>2</sup>	200 µm <sup>2</sup>	110 µm <sup>2</sup>	238 µm <sup>2</sup>	118 µm <sup>2</sup>	406 µm <sup>2</sup>
Volume by area	394 µm <sup>3</sup>	3.82E+03 µm <sup>3</sup>	868 µm <sup>3</sup>	4.44E+03 µm <sup>3</sup>	965 µm <sup>3</sup>	1.21E+04 µm <sup>3</sup>
Pixel count	340	1049	576	1247	618	2126
Aspect ratio	0.581	0.573	0.588	0.574	0.57	0.561
Circularity	0.798	0.777	0.814	0.77	0.742	0.719
Convexity	1	0.974	1	0.972	0.989	0.956
Elongation	0.419	0.427	0.412	0.426	0.43	0.439
Grayscale	183	183	175	175	187	187
Inscrib. circle diam.	6.21 µm	9.02 µm	8.18 µm	9.94 µm	8.07 µm	11.3 µm



**Figure S1.** Cumulative % of pore distribution related to for each cryogel samples: (A) 1:5; (B) 1:6; (C) 1:7 calculated by using Phenom Porometric 1.1.2.0 (Phenom-World BV, Eindhoven, The Netherlands).

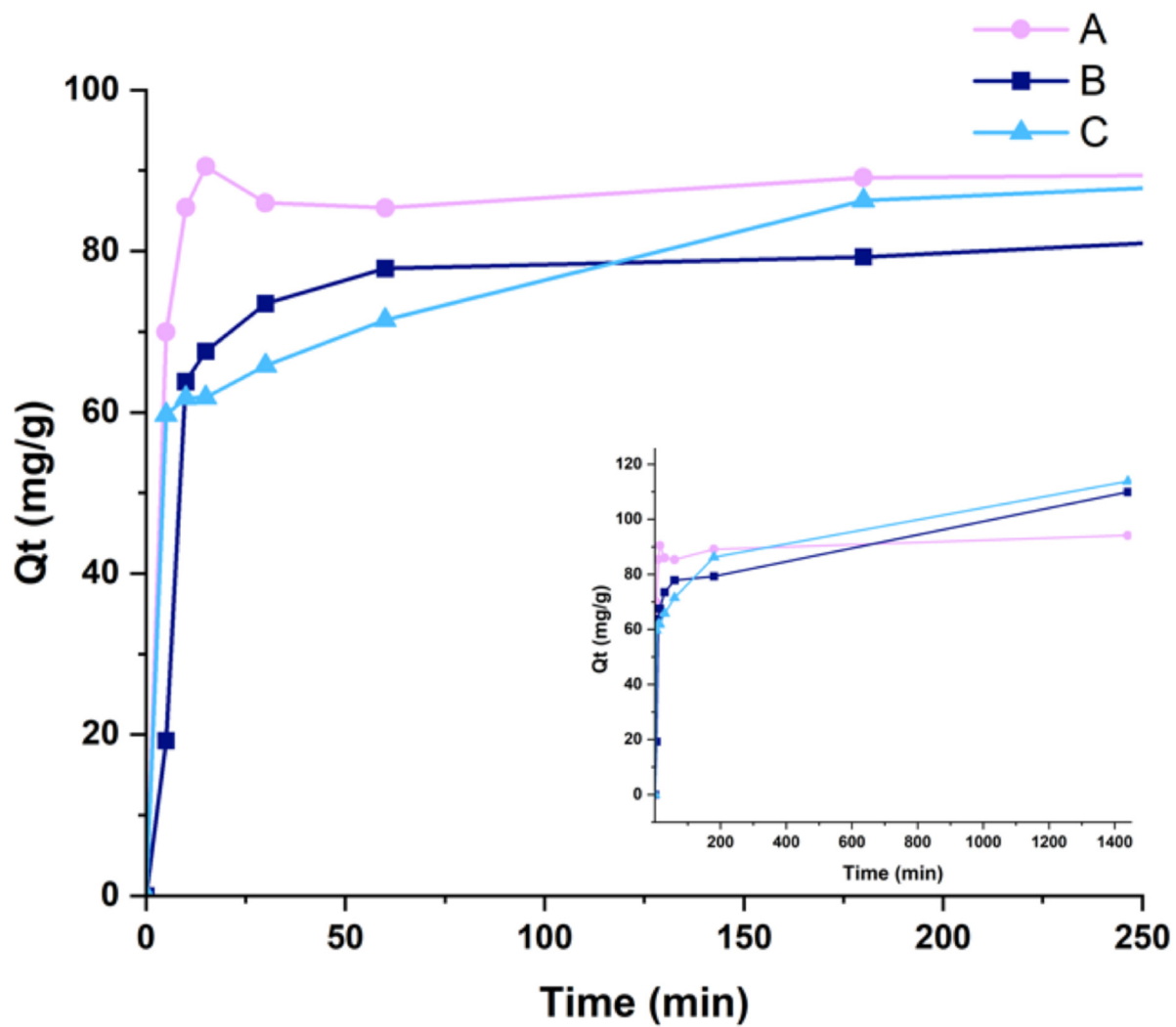


Figure S2. Variation of MV adsorption values as a function of time of the three synthesized samples.

Equation	$Y = a + b * x$
Plot	C
Weight	No Weighting
Intercept	$-7,03168E-4 \pm 0,004$
Slope	$0,12849 \pm 6,45411E$
Residual Sum of Squares	$2,72323E-5$
Pearson's r	0,99997
R-Square (COD)	0,99995
Adj. R-Square	0,99992

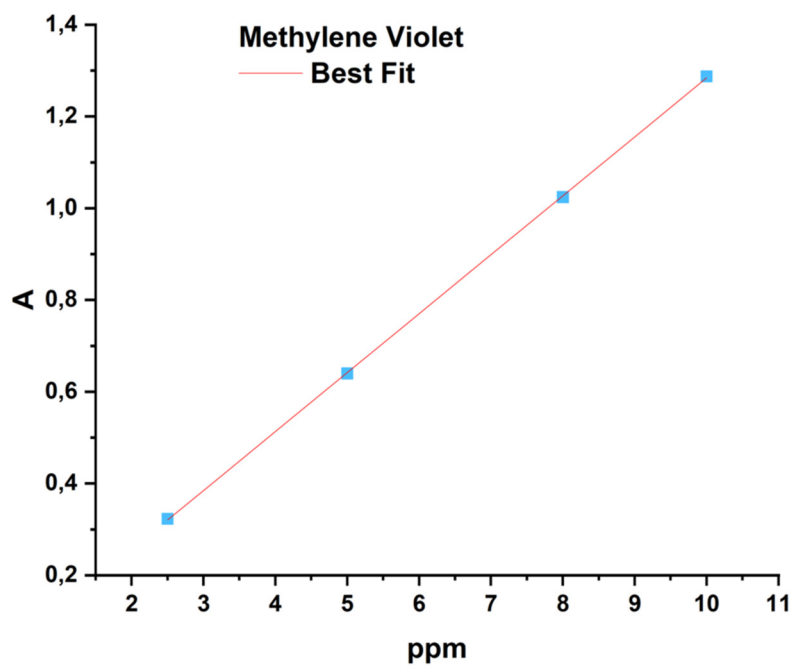


Figure S3. Calibration curve

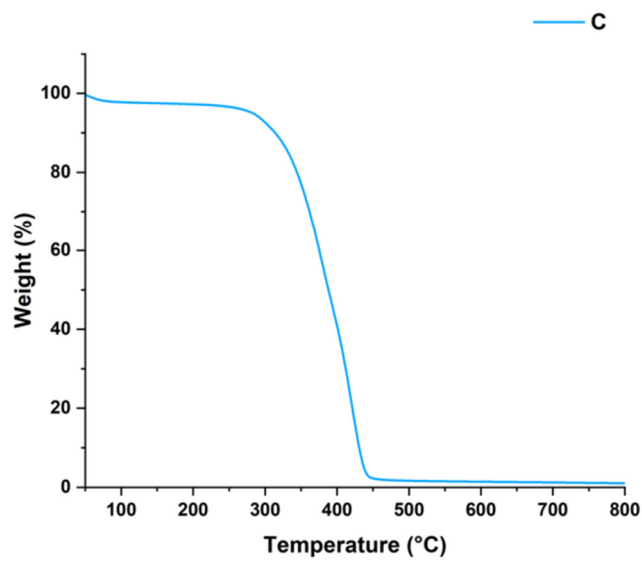
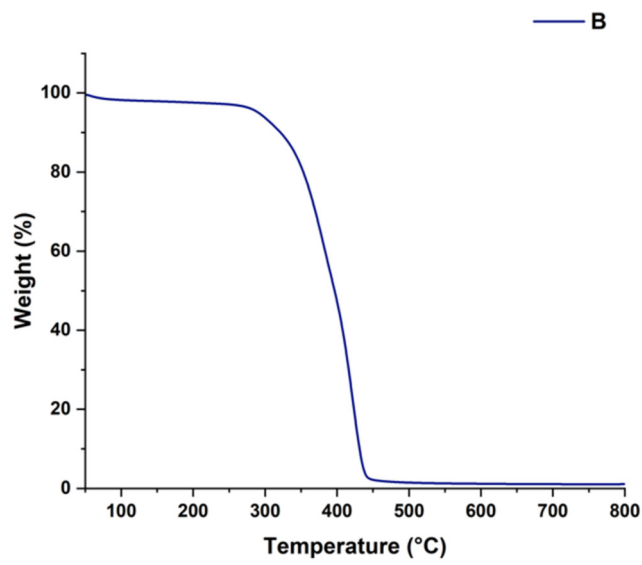
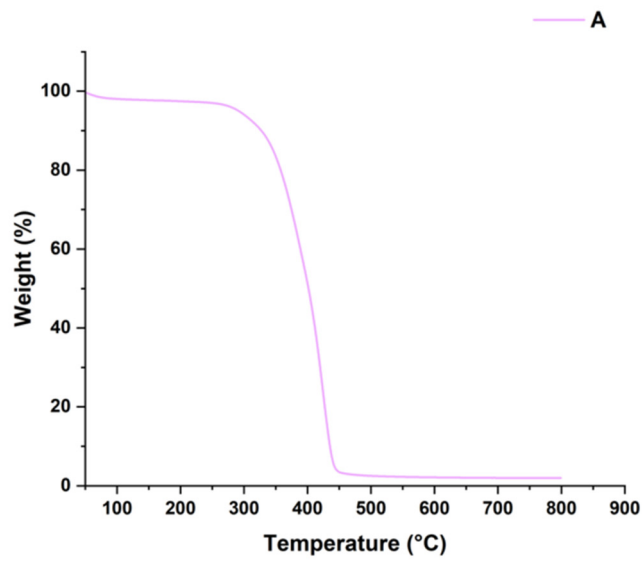
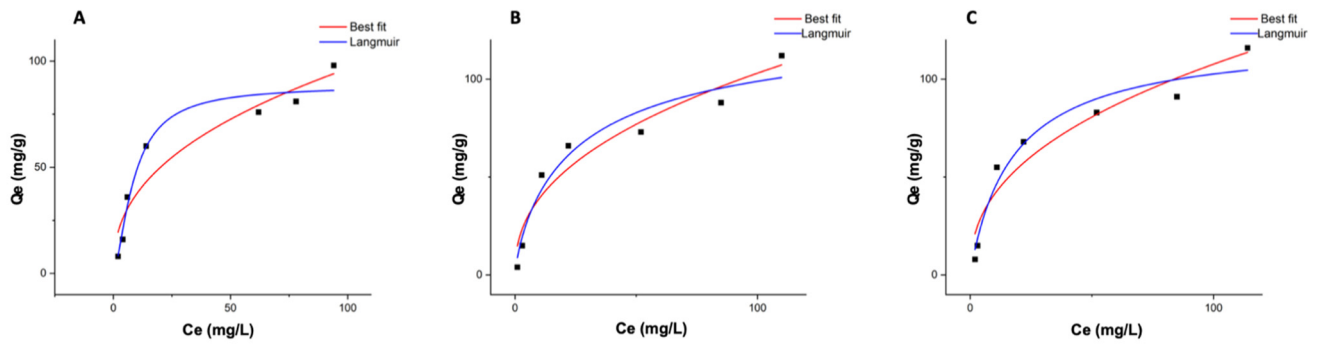


Figure S4. Thermograms of samples A, B, and C.

**Table S3.** Parameters obtained by applying Langmuir and Freundlich for the three synthesized cryogels.

Langmuir Model Parameters				
	* $Q_m$ (mg/g)	$K_L$	$R_L$	$R^2$
A	94	20,2	0.00009	0.9624
B	110	0.0308	0.0556	0.9529
C	114	0.0327	0.0494	0.9616

\* Maximum adsorption capacity



**Figure S5.** Equilibrium MV adsorption isotherms by plotting  $Q_e$  versus  $C_e$  experimental data for the three synthesized cryogels.

Langmuir model is described by Equation S1, where  $q_e$  (expressed in mg/g) represents the amount of methylene violet adsorbed,  $C_e$  (mg/L) is the concentration at the equilibrium,  $Q_0$  (mg/g) is the monolayer capacity, and  $b$  (mg/L) represents a constant whose value is related to the heat of adsorption ( $K_L$ ).

$$\text{Eq. S1:} \quad q_e = \frac{Q_0 b C_e}{1 + b C_e}$$

The following Equation S2, may be used to determine the separation factor ( $R_L$ ), related to the adsorption process' efficiency, from  $K_L$  value

$$\text{Eq. S2:} \quad R_L = \frac{1}{1 + K_L C_0}$$