

Aligned porous stimuli-responsive hydrogels via directional freezing and frozen UV initiated polymerization

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SUPPORTING INFORMATION

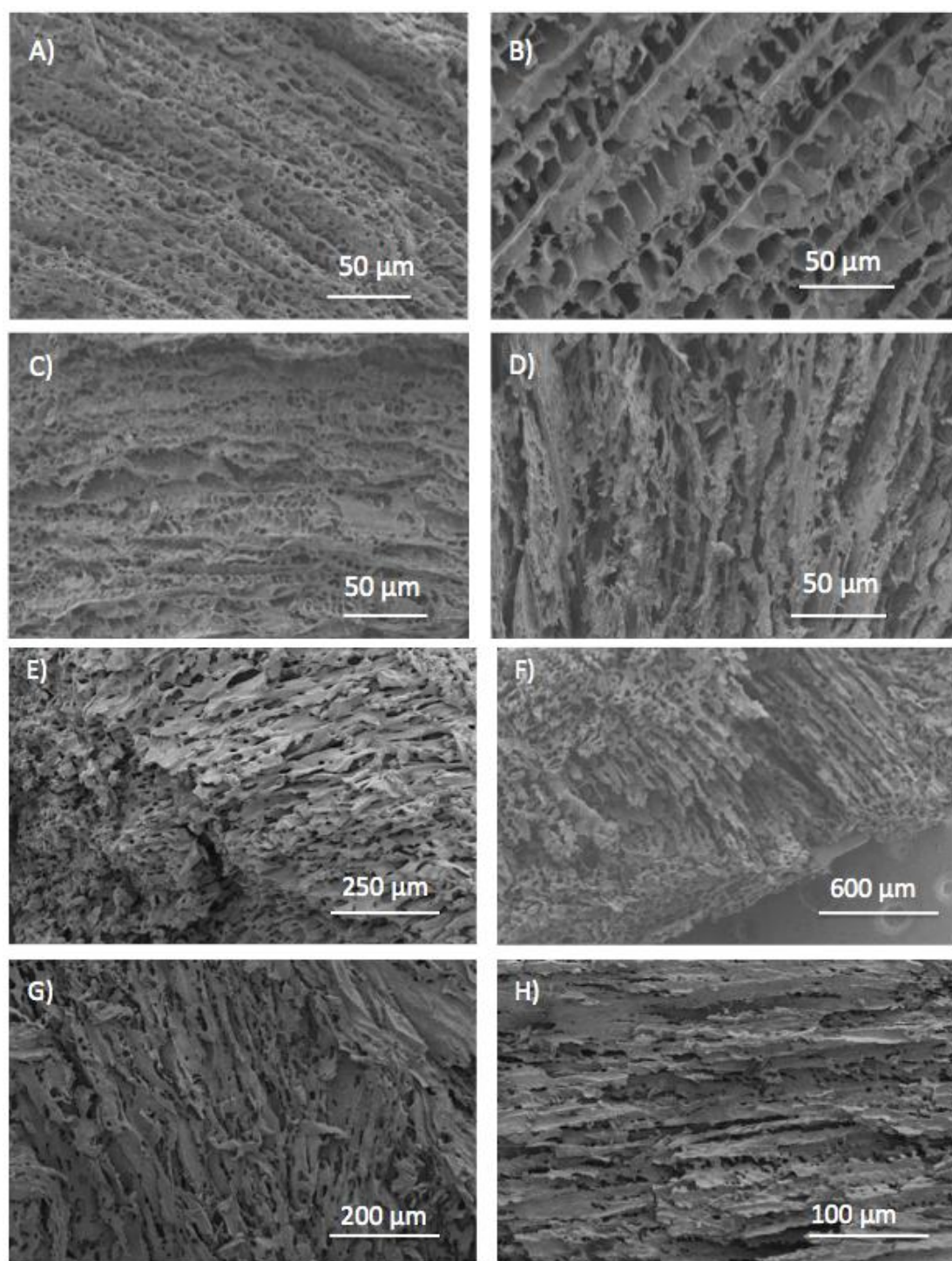


Figure S1. SEM images showing aligned porous structures made from solutions of: A) 1:5 OEGMA/dioxane (v/v) (3% EGDMA) B) 1:5 OEGMA/dioxane (v/v) (10% EGDMA). C) 1:10 OEGMA/dioxane (v/v) (3% EGDMA) D) 1:10 OEGMA/dioxane (v/v) (10% EGDMA) E) 1:5 DMAEMA/dioxane (v/v) (3% EGDMA) F) 1:5 DMAEMA/dioxane (v/v) (10% EGDMA) G) 1:10 DMAEMA/dioxane (v/v) (3% EGDMA) H) 1:10 DMAEMA/dioxane (v/v) (10% EGDMA)

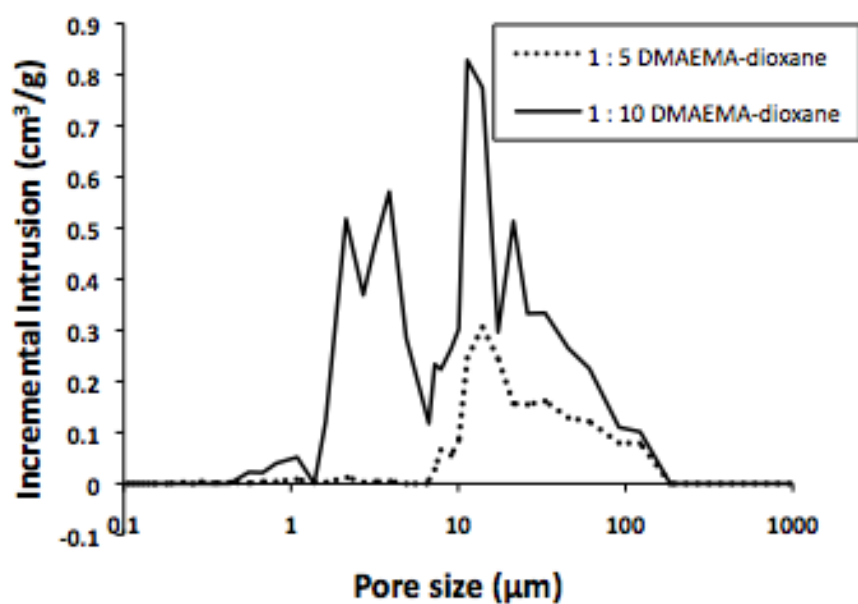


Figure S2. Pore size distributions of the samples prepared from 1:5 and 1:10 DMAEMA-dioxane (v/v) (10% EGDMA) by Hg intrusion porosimetry.

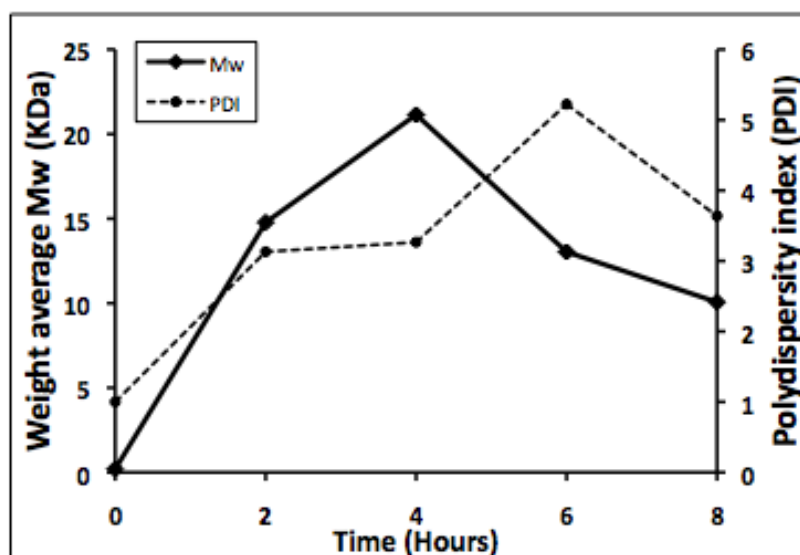


Figure S3. Plot of how weight average Mw and polydispersity change with polymerization time for 1 : 5 OEGMA to dioxane solutions with no crosslinker present.

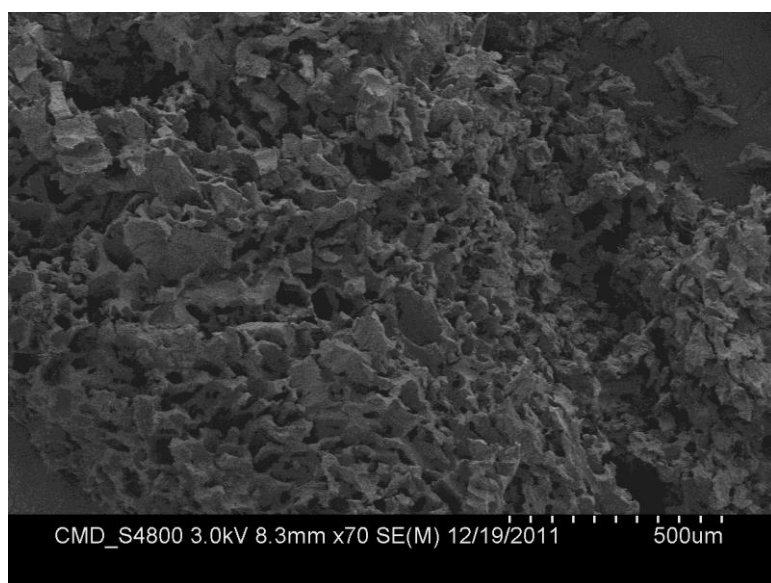


Figure S4. The SEM image shows the randomly porous structure for the hydrogel prepared by random freezing in freezer.

Table S1. Gel permeation chromatography (GPC) results for the 1:5 monomer(s)-dioxane solutions polymerized with no crosslinker.

OEGMA				DMAEMA			
Time (Hours)	Mn	Mw	PDI	Time (Hours)	Mn	Mw	PDI
0		≈ 200		0		157.2	
2	4724	14777	3.13	2	5294	11349	2.05
4	6475	21141	3.265	4	7469	17644	2.376
6	2495	13035	5.224	6	13623	36526	2.681
8	2767	10064	3.637	8	25303	64716	2.55

Table S2. Dimensions of hydrogels after soaking for 2 hours in different aqueous conditions. All the test samples are in cylindrical shape (10 mm length x 7 mm diameter).

SAMPLE	Dimensions in 4°C water (length x diameter mm)	Dimensions in 50°C water (length x diameter mm)
1:5 OEGMA/dioxane (v/v) (3% EGDMA)	13 x 9	10 x 7
1:5 OEGMA/dioxane (v/v) (5% EGDMA)	13 x 9	10 x 7
1:5 OEGMA/dioxane (v/v) (10% EGDMA)	13 x 9	10 x 7
1:10 OEGMA/dioxane (v/v) (3% EGDMA)	13 x 9	11 x 8
1:10 OEGMA/dioxane (v/v) (5% EGDMA)	13 x 9	11 x 8
1:10 OEGMA/dioxane (v/v) (10% EGDMA)	13 x 9	11 x 8
SAMPLE	Dimensions in 1M HCl (length x diameter mm)	Dimensions in 1M NaOH (length x diameter mm)
1:5 DMAEMA/dioxane (v/v) (3% EGDMA)	20 x 15	12 x 8
1:5 DMAEMA/dioxane (v/v) (5% EGDMA)	18 x 14	12 x 8
1:5 DMAEMA/dioxane (v/v) (10% EGDMA)	12 x 11	12 x 8
1:10 DMAEMA/dioxane (v/v) (3% EGDMA)	18 x 15	11 x 8
1:10 DMAEMA/dioxane (v/v) (5% EGDMA)	16 x 12	11 x 8
1:10 DMAEMA/dioxane (v/v) (10% EGDMA)	12x 10	11 x 8