† Electronic Supplementary Information (ESI) available: (1) Description and picture of home-made apparatus; (2) Pictures showing water resistance and no significant dimensional changes before and after two years water immersion; (3) Plotting showing water sorption by freeze-cast foamed latex and nanocomposite monoliths. See DOI: 10.1039/b000000x/

1) Description of home-made apparatus.

The home-made freeze-dryer (Fig. S1a) was attached to a glass chamber coated with a thermal blanket (Fig. S1b) and connected to a vacuum pump in order to improve the thermal insulation. That chamber contains therein a reservoir of liquid nitrogen to keep the round bottom glass flasks chilled during lyophilization. The pressure (90 mmHg) and temperature were measured using a vacuum gauge and a thermocouple of contact, respectively. Fig. S1c shows a crust of snow formed on the outside of a round bottom flask. After flasks reached room temperature, the samples were kept in the freeze-dryer for a further hour to ensure that were dry. Ice melting was not observed during freeze-drying.

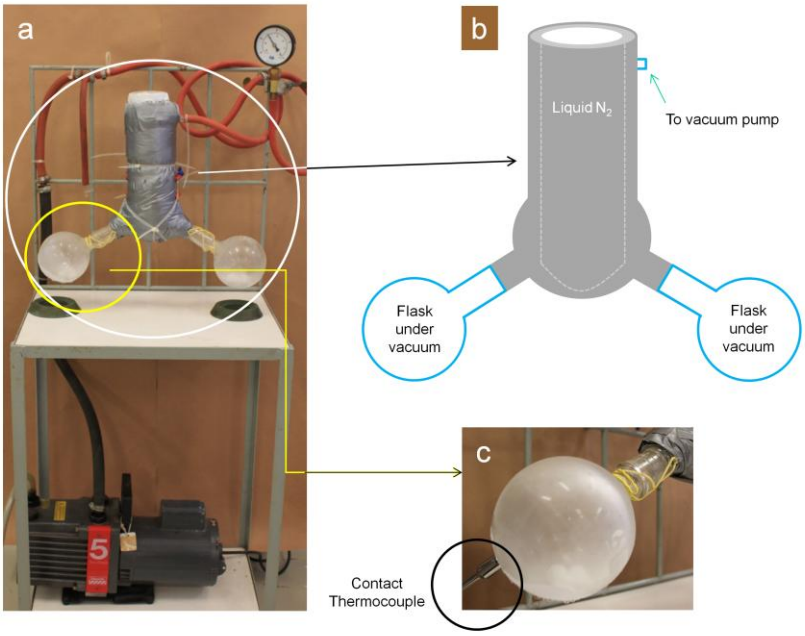
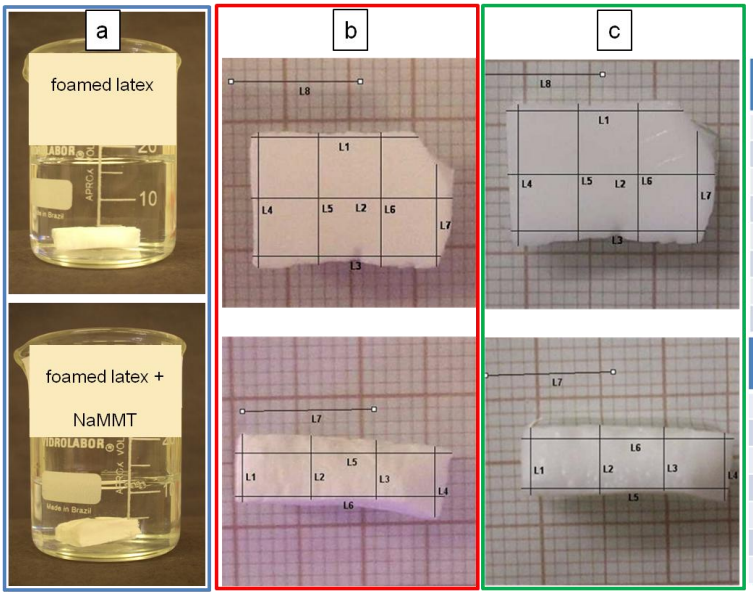


Fig. S1: Picture of home-made apparatus used in freeze-drying (a), schematic drawing showing the vacuum chamber and its interior (b) and detail of a round bottom glass flask under vacuum and a contact thermocouple (c).

2) Resistance to water tests



Features	Value (cm)	
	Before (b)	After (c)
L1	1.3018	1.3559
L2	1.5680	1.5819
L3	1.4615	1.4802
L4	1.0533	1.0791
L5	1.0237	1.0452
L6	1.0473	1.0565
L7	0.7929	0.8531
L8	1.0000	1.0000

Features	Value (cm)	
	Before (b)	After (c)
L1	0.5242	0.5246
L2	0.4864	0.5411
L3	0.4539	0.4969
L4	0.5404	0.5301
L5	1.6591	1.6234
L6	1.5996	1.6676
L7	1.0000	1.0000

Fig. S2. Pictures of freeze-cast foamed poly(styrene butyl acrylate acrylic acid) latex and nanocomposite monoliths immersed in deionized water for two years (a) and pictures of freeze-cast foamed latex monolith showing no significant dimensional changes before (b) and after two years (c) water immersion. The other freeze-cast samples showed similar behavior.

3) Water sorption

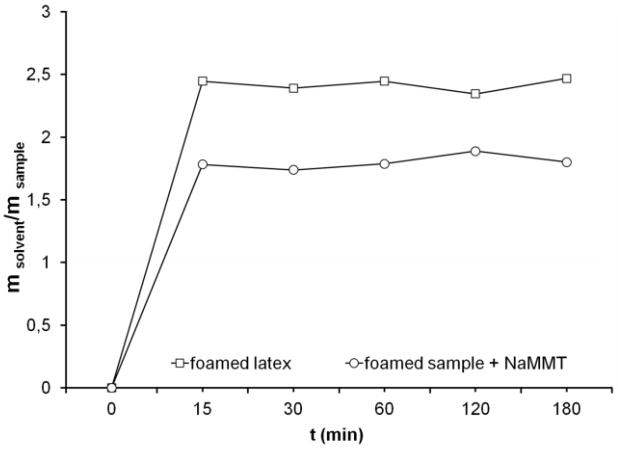


Fig. S3. Water sorption by freeze-cast foamed poly(styrene butyl acrylate acrylic acid) latex and nanocomposite monoliths.