

ESI

Modular microfluidic valve structures based on reversible thermoresponsive ionogel actuators

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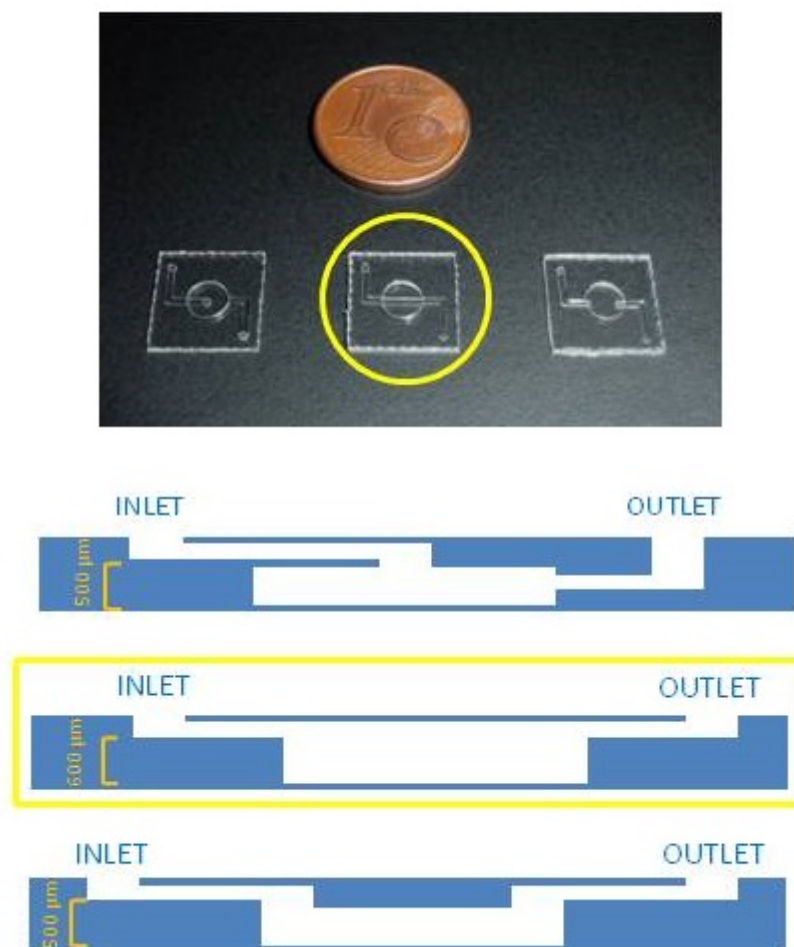


Figure ESI-1: Picture of the three valves used in this manuscript and respective cross sections; a) Volume = 6 μL b) Volume = 7 μL c) volume = 6 μL . In yellow the valve used for valve characterisation.

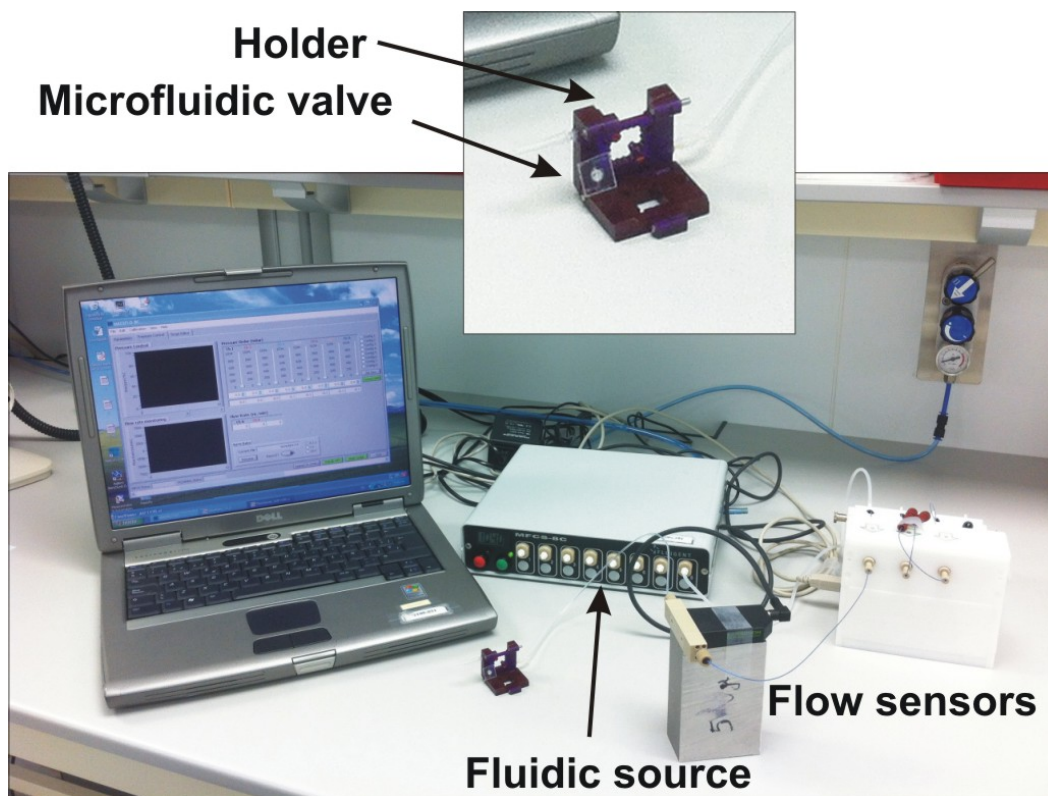


Figure ESI-2: Experimental set-up for the characterisation of the valve.

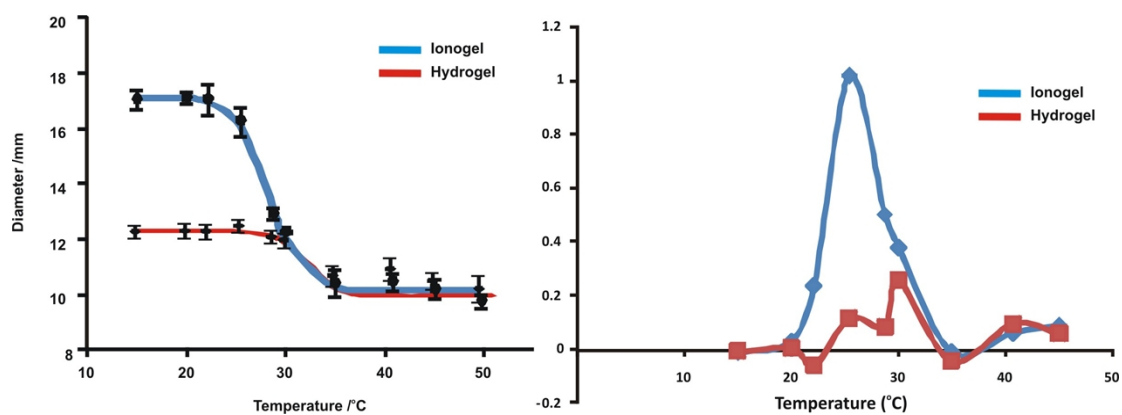


Figure ESI-3: Size (diameter) changes *versus* temperature of both pNIPAAm ionogel and hydrogel discs for LCST transition calculations (left), and average LCST comparison (right).

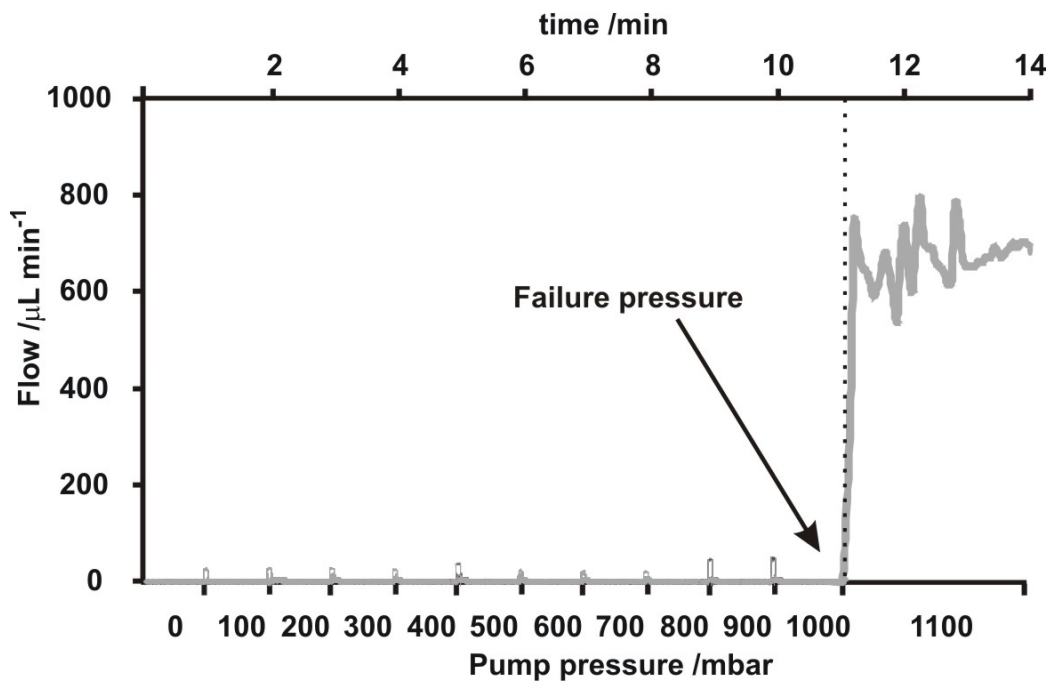


Figure ESI-4: Failure pressure value determination for a modular microfluidic device ionogel valve.

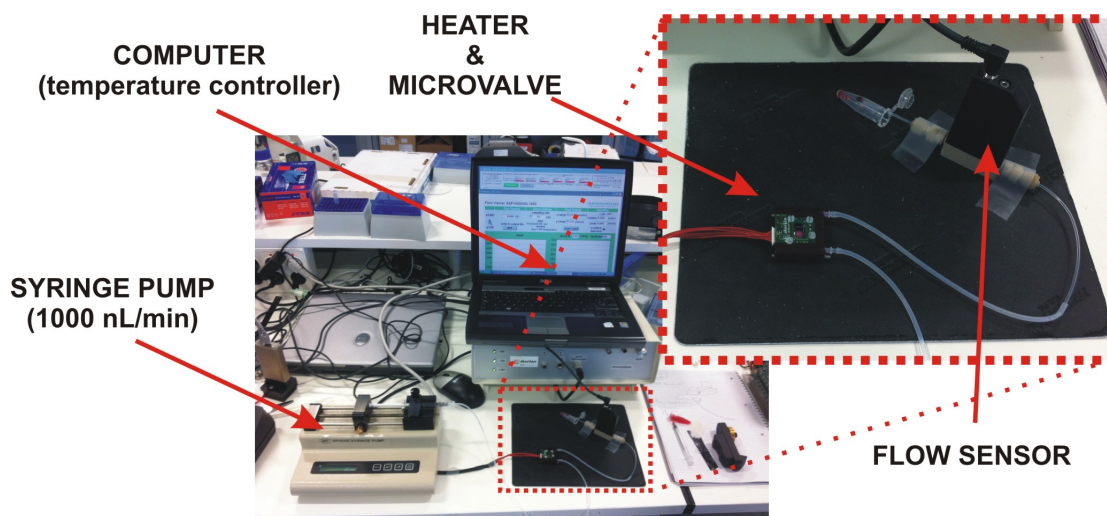


Figure ESI-5: Thermo-actuated experimental set-up for the module microfluidic device incorporating an ionogel valve.

Table ESI-1: FTIR signals of the hydrogel, ionogel and the ionic liquid.

Assignment	Poly(NIPAAm)	EMIES	Ionogel	Ref.
N-H (stretch)	3293		3306	[1], [2]
C45-H (stretch)		3155	3157	[3]
C2-H (stretch)		3108	3110	[3]
C=O (stretch - Amide I)	1640		1646	[1], [2]
C=N (stretch)		1574	1570 (sh)	[3]
N-H (in plane bending -Amide II)	1539		1543	[1], [2]
C-CH ₃ (sym. bending)	1388		1392	[1], [2]
C-CH ₃ (sym. bending)	1368		1368	[1], [2]
SO ₃ (asym. stretch)		1217	1219	[3]
SO ₃ (sym. stretch)		1015	1018	[3]

sh – shoulder

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