Electrical Supplementary Information for

Brittle-flexible-brittle transition in nanocrystalline zirconia nanofibrous membranes

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Table S1 Summary of lattice parameters and grain size of theoretical zirconia and experimental zirconia and yttria stabilized zirconia (YSZ) nanofibrous membranes with yttria contents from 2 to 20 mol%.

Yttria content (mol%)	Lattice constants						Grain size (nm)		
	a (Å)	b (Å)	c (Å)	α (˚)	β (˚)	γ (˚)	Monoclinic	Tetragonal	Cubic
0	5.312	5.182	5.148	90	99.2	90	25.8	36.1	-
2	3.612	-	5.176	90	90	90	-	28.8	-
4	3.620	-	5.161	90	90	90	-	26.6	-
6	3.628	-	5.144	90	90	90	-	23.8	-
8	5.136	-	-	90	90	90	-	-	18.7
10	5.129	-	-	90	90	90	-	-	15.4
12	5.133	-	-	90	90	90	-	-	13.5
14	5.142	-	-	90	90	90	-	-	12.6
16	5.143	-	-	90	90	90	-	-	12.3
18	5.144	-	-	90	90	90	-	-	11.2
20	5.135	-	-	90	90	90	-	-	10.6
Theoretical lattice constants									
Monoclinic	5.145	5.207	5.311	90	99.2	90	-	-	-
Tetragonal	3.640	-	5.270	90	90	90	-	-	-
Cubic	5.090	-	-	90	90	90	-	-	-

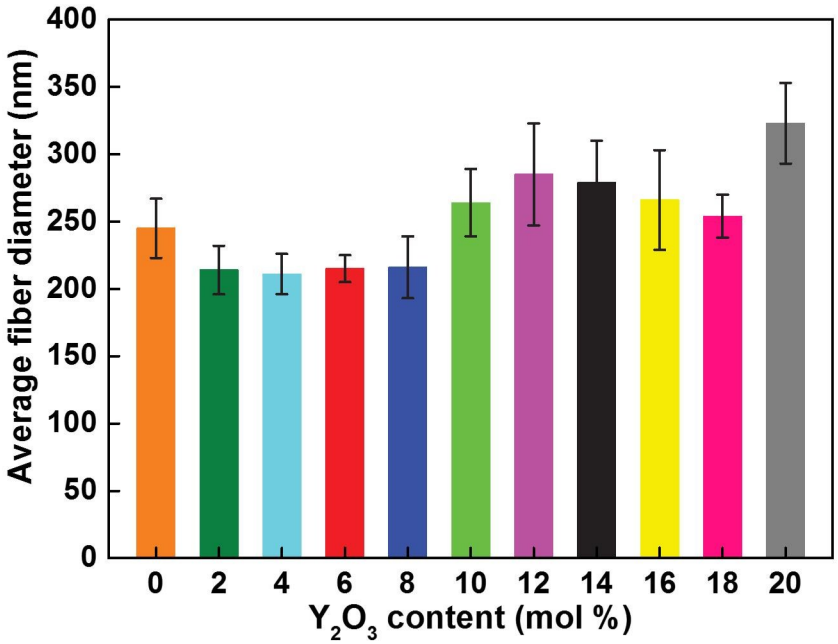

Fig. S1 Average fiber diameters of zirconia and YSZ nanofibers with yttria contents from 2 to 20 mol%.

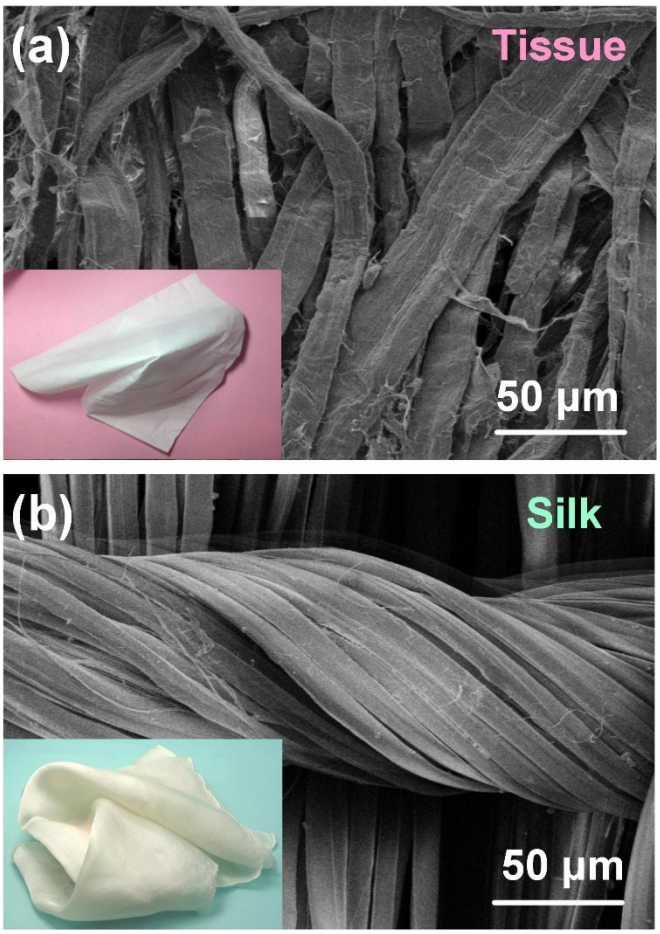

Fig. S2 FE-SEM images of (a) tissue and (b) silk. The insets show the photographs of tissue and silk, respectively.

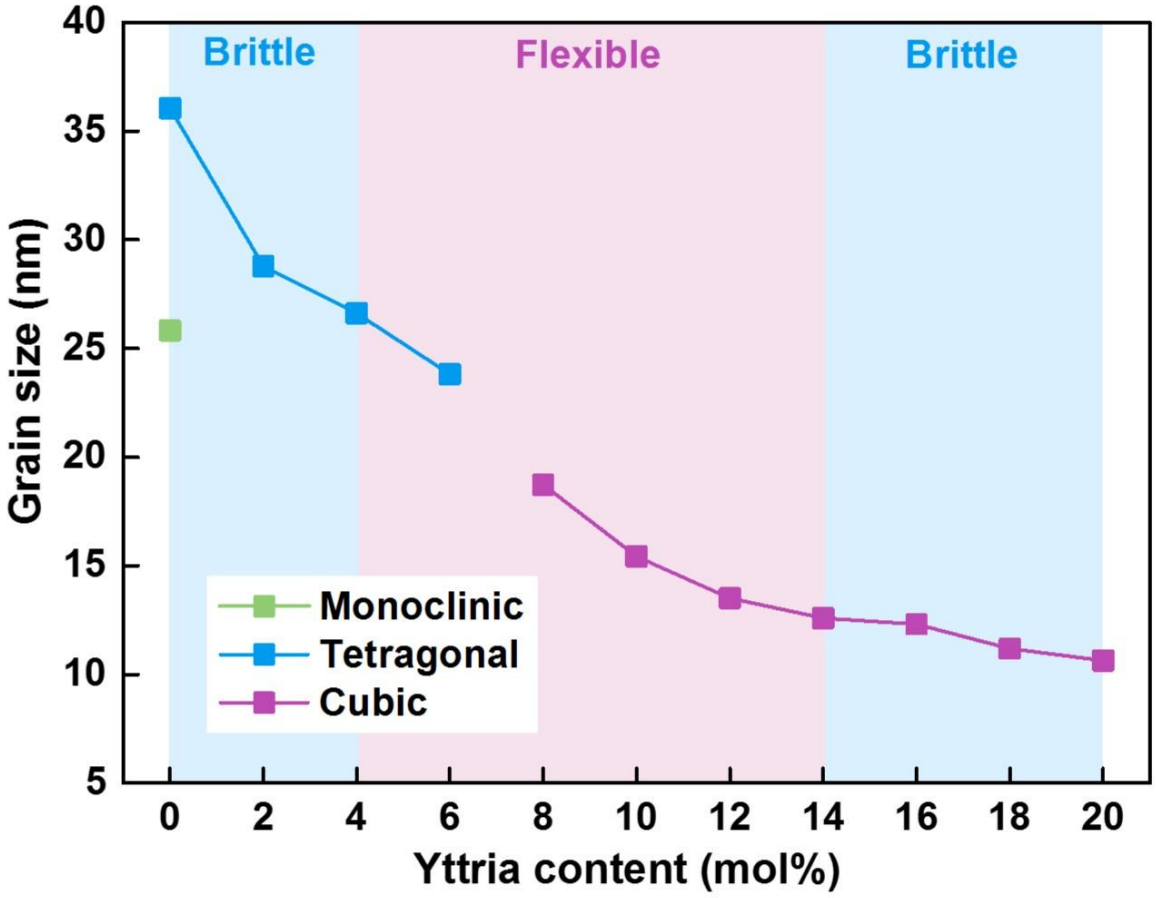

Fig. S3 Flexible (pink) and brittle (blue) regions of zirconia and YSZ nanofibrous membranes with different crystal forms and grain sizes.

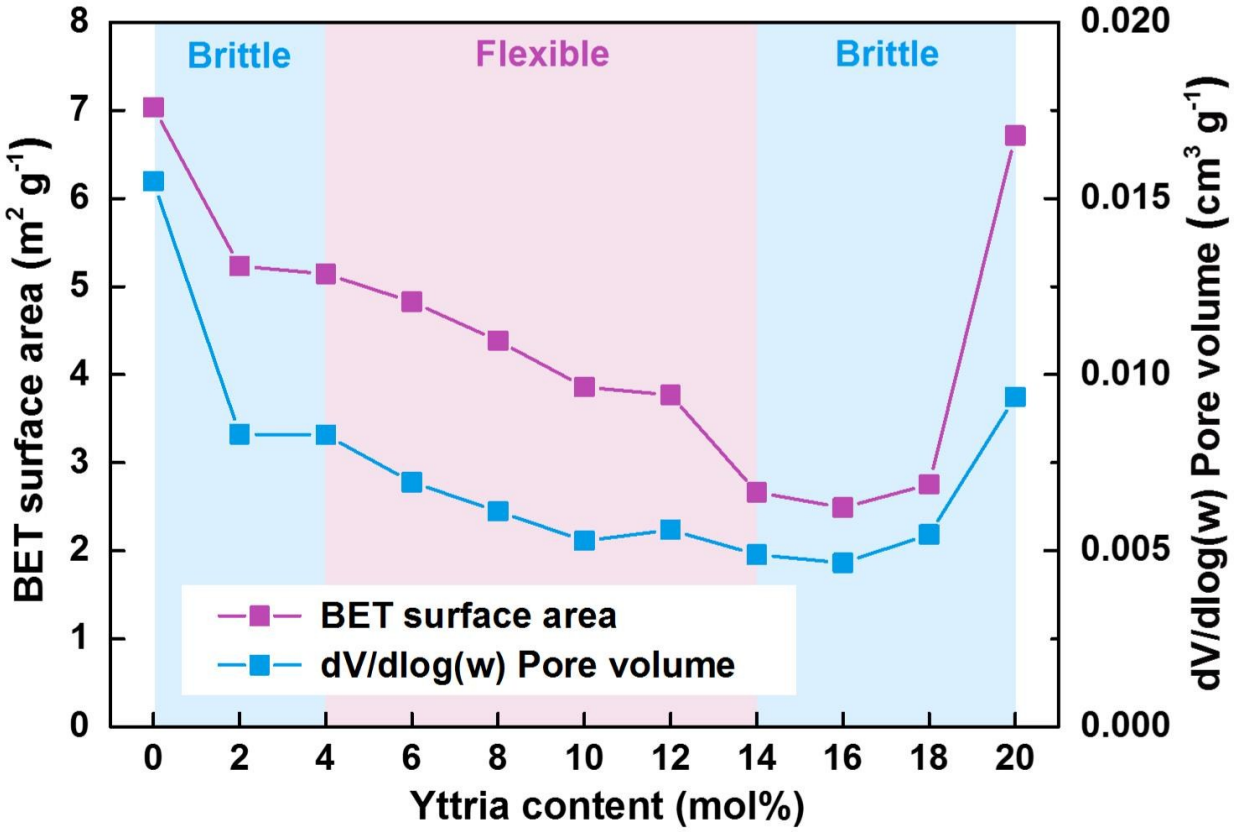

Fig. S4 Flexible (pink) and brittle (blue) regions of zirconia and YSZ nanofibrous membranes with different BET surface areas and pore volumes.