

## Supporting information

# Fabrication of Polyimide Aerogels Cross-linked by a Cost-effective Amine-functionalized Hyperbranched Polysiloxane ( $\text{NH}_2\text{-HBPSi}$ )

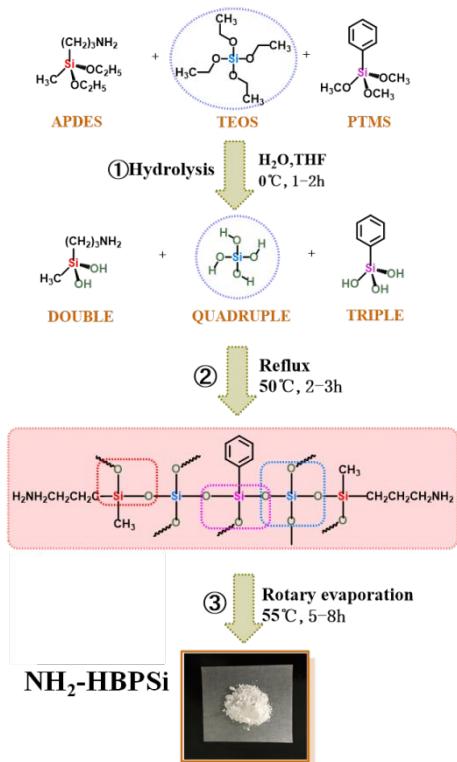
Tingting Wu<sup>a</sup>, Jie Dong<sup>a,\*</sup>, Kevin De France<sup>b</sup>, Mengmeng Li<sup>a</sup>, Xin Zhao<sup>a,\*</sup>, Qinghua Zhang<sup>a</sup>

<sup>a</sup> State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, P. R. China

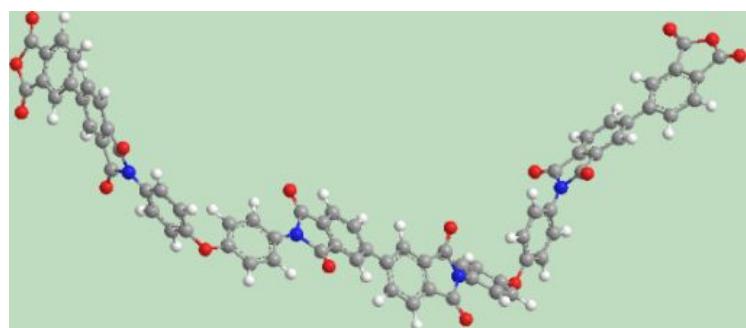
<sup>b</sup> Cellulose & Wood Materials Laboratory, Empa, Überlandstrasse 129, CH-8600, Dübendorf, Switzerland

\*Corresponding author: dj01@dhu.edu.cn; [xzhao@dhu.edu.cn](mailto:xzhao@dhu.edu.cn)

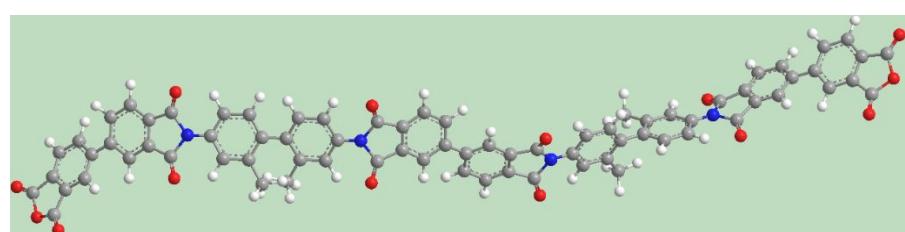
**Scheme S1.** General synthesis route for the  $\text{NH}_2\text{-HBPSi}$  macromer.



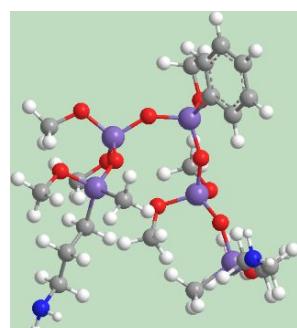
**BPDA-ODA :**



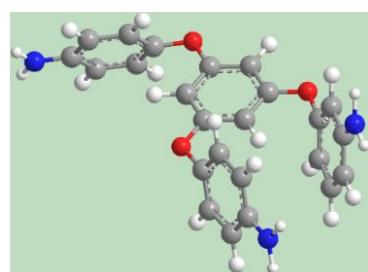
**BPDA-DMBZ :**



**NH<sub>2</sub>-HBPSi :**



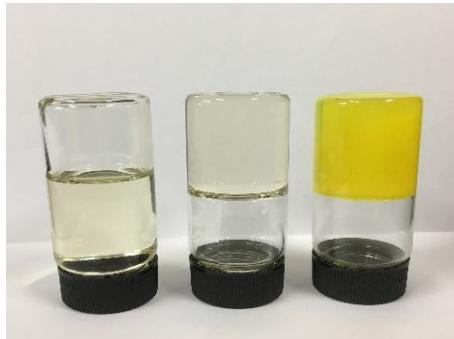
**TAB :**



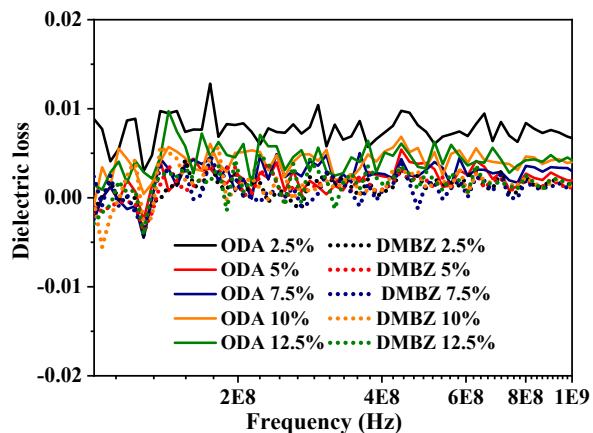
**Figure S1.** Molecular model of dimers of BPDA-ODA, BPDA-DMBZ, NH<sub>2</sub>-HBPSi macromer and commercial cross-linking agent TAB. The grey, white, red, blue, and purple atoms in molecular structure represent C, H, O, N, and Si, respectively.

**Table S1.** The list of the price of the reagents in this work and the commercial TAB we used in previous work

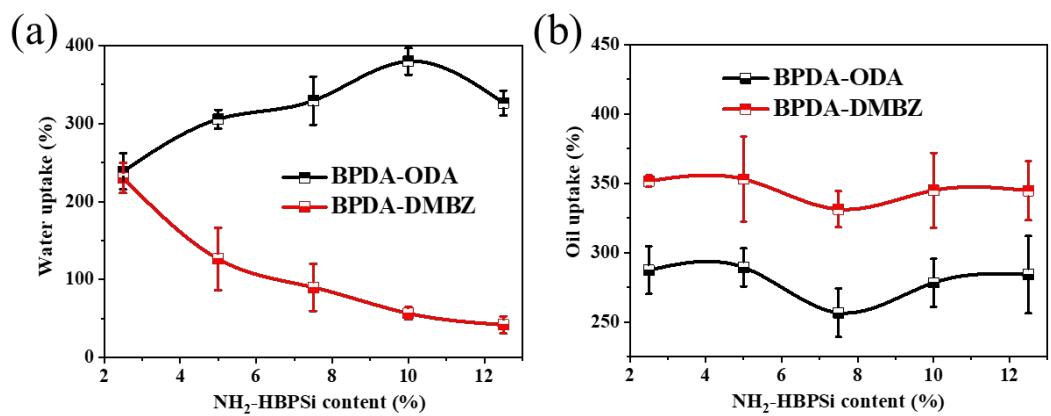
Reagents	1,3,5-triaminophenoxybenzene (TAB)	$\gamma$ -Aminopropylmethyldiethoxysilane (APDES)	Tetraethoxysilane (TEOS)	Phenyltrimethoxysilane (PTMS)
Price	150 \$/5g	158 \$/250mL	26 \$/500mL	82 \$/50g



**Figure S2.** Photographs of PAA solution (left), NH<sub>2</sub>-HBPSi cross-linked PAA gels and NH<sub>2</sub>-HBPSi cross-linked PI gels (2.5 wt%).



**Figure S3.** Loss tangents of ODA- and DMBZ-based PI aerogels made using various NH<sub>2</sub>-HBPSi crosslinker concentrations.



**Figure S4.** Graphs of (a) water (b) seed oil uptake capacity of ODA- and DMBZ-based PI aerogels made using various NH<sub>2</sub>-HBPSi crosslinker concentrations.