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PII: S0266-3538(15)30054-3

DOI: 10.1016/j.compscitech.2015.08.006

Reference: CSTE 6168

To appear in: *Composites Science and Technology*

Received Date: 17 June 2015

Revised Date: 5 August 2015

Accepted Date: 7 August 2015

Please cite this article as: Song P'a, Xu Z, Lu Y, Guo Q, Bioinspired Strategy for Tuning Thermal Stability of PVA via Hydrogen-Bond Crosslink, *Composites Science and Technology* (2015), doi: 10.1016/j.compscitech.2015.08.006.

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# Bioinspired Strategy for Tuning Thermal Stability of PVA via Hydrogen-Bond Crosslink

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**Abstract:** Although many approaches have been employed to enhance thermal stability of PVA, developing a facile and effective strategy remains highly attractive. Herein, we demonstrate a highly effective approach to strikingly improve thermal stability of PVA by selecting the types of multiamines molecules to tune the hydrogen-bond crosslink density. Results show that only adding 0.5 wt% of 2,4,5,6-tetraaminopyrimidine can make the initial degradation temperature ($T_i$) and maximum degradation temperature ($T_{max}$) of PVA increase by ~55 $^oC$ and 98 $^oC$ due to the formation of 3D physically H-bond crosslinked network, resulting in superior thermal stability property to those of PVA nanocomposites. Moreover, thermal stability strongly depends on the H-bond crosslink density, and $T_i$ and $T_{max}$ basically obey the linear hydrogen-bond relations despite some deviations. This work opens up a novel biological methodology for creating thermally stable polymeric materials.

*Keywords:* A. Polymers; B. Thermal properties; D. Infrared (IR) spectroscopy;

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