Electronic Supplementary Material (ESI) for Polymer Chemistry

Supporting information

‘One Pot’ Synthesis of Well-defined Poly(aminophosphonate)s: Time for Kabachnik-Fields Reaction on Stage of Polymer Chemistry

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Experimental Section

1. Materials

N-(3-aminopropyl) methacrylamide (APMA, Tongchuang Pharma Co., Ltd, 98%), benzaldehyde (Aladdin, 99%), diethyl phosphite (Aladdin, 99%), triethylamine (TEA, Sinopharm Chemical Reagent, AR), 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU, Sinopharm Chemical Reagent, 99%), 4-hydroxybenzaldehyde (Aladdin, 98%), 4-dimethylaminobenzaldehyde (Aladdin, 98%), 2-pyridylaldehyde (Aladdin, 98%), trans-cinnamaldehyde (Sinopharm Chemical Reagent, 98%), hexanaldehyde (Aladdin, 97%), and 2,2'-azobis(2,4-dimethylvaleronitrile) (ABVN, J&K Chemical, 97%) were all used as purchased. 4-cyano-4-(ethylthiocarbono-thioylthio) pentanoic acid using as chain transfer agent (CTA) and polyAPMA were synthesized as reported[1,2]. Solvents as acetonitrile, ethanol, and methanol were purchased from of Sinopharm Chemical Reagent and used directly without further purification.

2. Instrumental Analysis

Gel permeation chromatography (GPC) analyses of polymers were performed using N, N-dimethyl formamide (DMF) as the eluent. The GPC system was a Shimadzu LC-20AD pump system consisting of an auto injector, a MZ-Gel SDplus 10.0 μm guard column(50 × 8.0 mm, 10^2 $Å$) followed by a MZ-Gel SDplus 5.0 μm bead-size column (50 – 10^6 $Å$, linear) and a Shimadzu RID-10A refractive index detector. The system was calibrated with narrow molecular weight distribution polystyrene standards ranging from 200 to 10^6 $g\ mol^{-1}$. ^{1}H NMR and ^{13}C NMR spectra were obtained using a JEOL JNM-ECA400 (400 MHz) spectrometer for all samples. The ESI-MS data were collected using a Micro TOF-QII Bruker. The FT-IR spectra were made in a transmission mode on a Perkin-Elmer Spectrum 100 spectrometer.

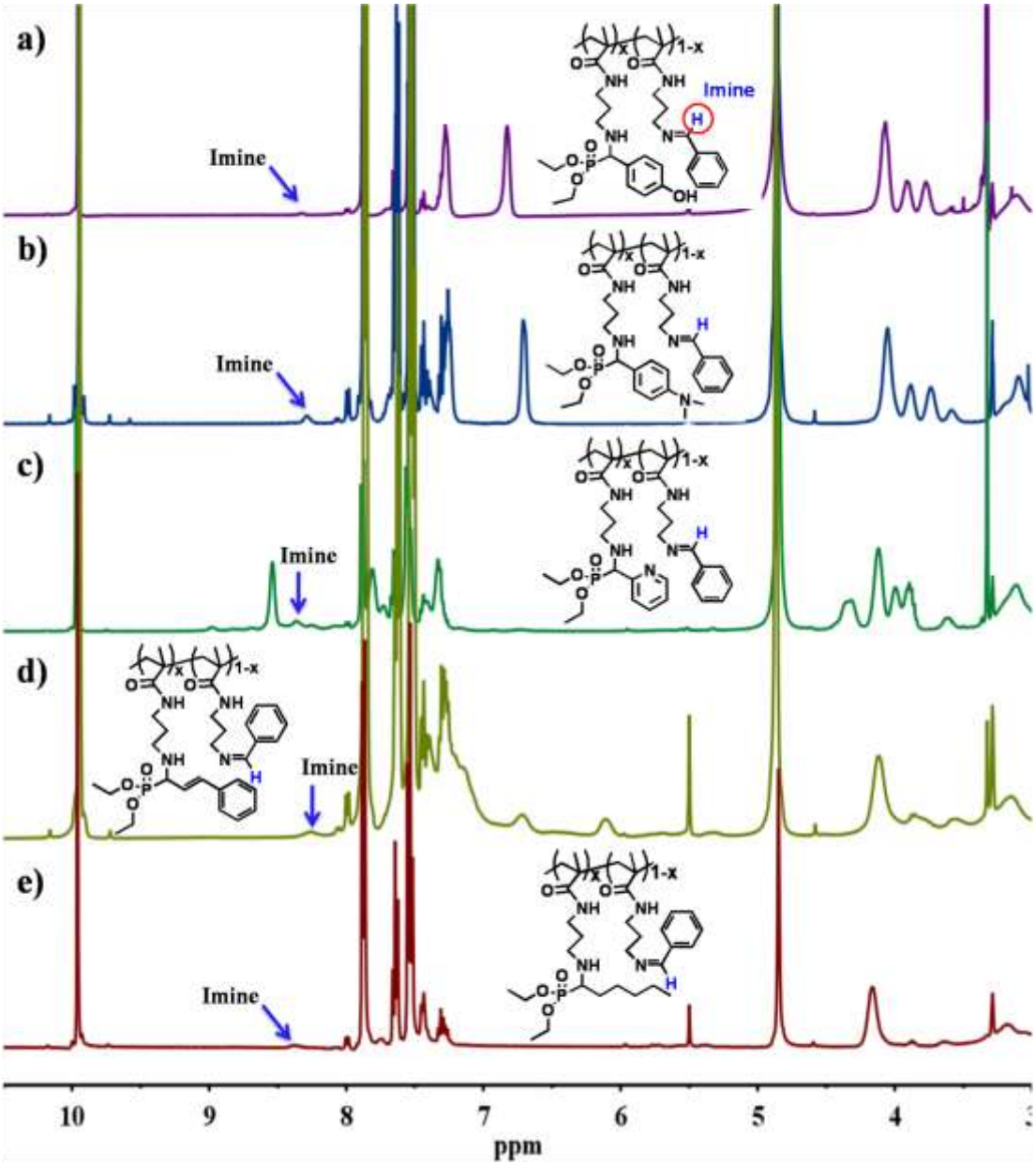

Figure S1. ^{1}H-NMR spectra of various polyAPPs a) 4-hydroxybenzaldehyde, b) 4-dimethylaminobenzaldehyde, c) 2-pyridylaldehyde, d) *trans*-cinnamaldehyde, e) hexanaldehyde after adding excess benzaldehyde for the modification efficiency calculation.

Reference

1. L. Tao, J. Liu and T. P. Davis, *Biomacromolecules*, 2009, **10**, 2847-2851.

2. Z. Deng, H. Bouchékif, and K. Babooram, *Journal of Polymer Science Part A: Polymer Chemistry*, 2008, **46**, 4984-4996.