Improved Large Scale Synthesis and Characterization of Small and Medium Generation PAMAM-dendrimers

Supporting Information

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NMR-Spectroscopy:

Core: DAB-PAMAM-(CO₂Me)₄ [1]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G0: DAB-PAMAM-(NH₂)₄ [2]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G0.5: PAMAM(CO₂Me)₈ [3]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G1: PAMAM(NH₂)₈ [4]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G1.5: PAMAM(CO₂Me)₁₆ [5]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G2: PAMAM(NH₂)₁₆ [6]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G2.5: PAMAM(CO₂Me)₃₂ [7]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G3: PAMAM(NH₂)₃₂ [8]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G3.5: PAMAM(CO₂Me)₆₄ [9]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G4: PAMAM(NH₂)₆₄ [10]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

G4.5: PAMAM(CO₂Me)₁₂₈ [11]

¹H-NMR (500 MHz, MeOD-*d*₄):

¹³C-NMR (125 MHz, MeOD-*d*₄):

G5: PAMAM(NH₂)₁₂₈ [12]

¹H-NMR (500 MHz, MeOD-d₄):

¹³C-NMR (125 MHz, MeOD-d₄):

Mass Spectrometry

Multi Angular Light Scattering

MALS batch measurement G2: PAMAM(NH₂)₁₆:

MALS batch measurement G3: PAMAM(NH₂)₃₂:

MALS batch measurement G4: PAMAM(NH₂)₆₄:

MALS batch measurement G5: PAMAM(NH₂)₁₂₈:

Chromatogram G4: PAMAM(NH₂)₆₄ in PBS and citric acid buffer:

SEC-MALS chromatogram of a G4 PAMAM dendrimer using PBS buffer (red) and citric acid buffer (green), highlights that PBS is not a suitable buffer solution for amine terminated PAMAM dendrimers due to interactions with the column that led to absorption and tailing of the dendrimer.

MALDI:

G0: PAMAM(NH₂)₄:

G1: PAMAM(NH₂)₈:

G2: PAMAM(NH₂)₁₆:

G3: PAMAM(NH₂)₃₂:

G4: PAMAM(NH₂)₆₄:

G5: PAMAM(NH₂)₁₂₈:

ESI

G0: PAMAM(NH₂)₄:

G1: PAMAM(NH₂)₈:

G2: PAMAM(NH₂)₁₆:

G3: PAMAM(NH₂)₃₂:

G4: PAMAM(NH₂)₆₄:

G5: PAMAM(NH₂)₁₂₈:

IR-Spectroscopy

FT-IR-Spectra (Absorbance) of G0-G5 amine terminated PAMAM dendrimers: