

Sample #: P9980-PrAA

$$\left[\text{CH}_2 - \underset{\text{CO}_2\text{H}}{\overset{\text{CH}_2\text{CH}_2\text{CH}_3}{\text{C}}} \right]_n$$

$\text{Mn} \times 10^3$	PDI
8.0	1.15
$T_g (^{\circ}\text{C})$	143

as illustrated in the following scheme.

$$\text{CH}_3-\text{CH}_2-\text{CH}(\text{COOC}_2\text{H}_5)-\text{COOH} \xrightarrow{\text{1) KOH in Ethanol}} \text{CH}_3-\text{CH}_2-\text{CH}(\text{COOC}_2\text{H}_5)-\text{COOH}$$

$$\text{CH}_3-\text{CH}_2-\text{CH}(\text{COOC}_2\text{H}_5)-\text{COOH} \xrightarrow{\text{1) } (\text{C}_2\text{H}_5)_3\text{NH}^+ / -5^\circ\text{C}} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOC}_2\text{H}_5$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOC}_2\text{H}_5 \xrightarrow{\text{2) HCHO}} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{3) conc. H}_2\text{SO}_4} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{1) KOH in water}} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{2) HCl}} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{POCl}_3} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{Et}_3\text{N}} \text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH}$$

$$\text{H}_2\text{C}=\text{C}(\text{CH}_2\text{CH}_2\text{CH}_3)-\text{COOH} \xrightarrow{\text{Anionic polymerization in THF at } -78^\circ\text{C for 50h}} \text{Polymer}$$

$$\text{Polymer} \xrightarrow{\text{Hydrolysis}} \text{Polymer}$$

Polymer is soluble in ethanol, methanol
THF, Dioxane.

¹H NMR spectrum of P9980-tBuPrA in CDCl₃. The spectrum shows peaks at approximately 7.2 ppm (CDCl₃), 7.1 ppm (H₂O), 1.5 ppm (tBu), 1.2 ppm (Pr), and 0.9 ppm (CH₃). The integration values are shown below the baseline.

Poly propyl acrylic acid: Mn 8000 Mw/Mn 1.15

DSC thermogram of poly(2-vinylpyridine) showing heat flow versus temperature. The plot displays two curves with transition points labeled at 124.95°C, 142.79°C(I), and 151.97°C. The y-axis represents Heat Flow (W/g) from -0.7 to -1.0, and the x-axis represents Temperature (°C) from 110 to 180. The label 'Exo Up' is present at the bottom left, and 'Universal V4.2E TA Instruments' is at the bottom right.