Supporting Information

One-Pot Synthesis of Chemically Modified Vegetable oils

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** Names are necessary to report factually on available data; however, the USDA neither guarantees nor warrants the standard of the product, and the use of the name by USDA implies no approval of the product to the exclusion of others that may also be suitable.

The ^{1}H and ^{13}C NMR data of diester derivatives PSO1, BSO1, iBSO1, VSO1, HxSO1, and HpSO1:

The PSO1 ^{1}H NMR: (500 MHz, $CDCl_3$, ppm): δ 5.26 (t, 1, CH proton of –CH_2-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 2.2, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 5.7, CH protons of the epoxy ring), 2.5-2.23 (t, 7.1, CH_2 protons α to carboxy group of fatty chain and acyl side chain), 1.8-1.2 (m, 70, unresolvable signals from CH_2 protons of fatty acid chain), 1.15 (t, 6.7, CH_3 protons on the end of acyl side chain), 0.95-0.72 (t, 9.5, CH_3 protons on the end of the fatty chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.3, 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76-75 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 34.0-22.6 (multiple signals from fatty carbon chain), 14.0 (CH_3 end carbon of fatty chain), 10.8 (CH_3 end carbon of acyl side chain). The spectral peaks and assignments are close to computed chemical shift and in correct order.

The BSO1 ^{1}H NMR: (500 MHz, $CDCl_3$, ppm): δ 5.26 (t, 1, CH proton of –CH_2-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 1.7, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 5.2, CH protons of the epoxy ring), 2.5-2.23 (t, 7.4, CH_2 protons α to carboxy group of fatty chain and acyl side chain), 1.8-1.2 (m, 75.4, unresolvable signals from CH_2 protons of fatty acid chain and acyl side chain), 1.06-0.72 (t, 11.7, CH_3 protons on the end of the fatty chain and acyl side chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76-

75 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 36.5-22.6 (multiple signals from fatty carbon chain and acyl side chain), 18.4 (CH_2 α to end carbon of acyl side chain), 14.1-13.9 (CH_3 end carbon of fatty chain and acyl side chain). The spectral peaks and assignments are close to computed chemical shift and in correct order.

The iBSO1 ^{1}H NMR: (500 MHz, $CDCl_3$, ppm): δ 5.26 (t, 1, CH proton of –CH_2-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 1.7, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 5.6, CH protons of the epoxy ring), 2.55 (b, 1.5, CH protons α to carboxy group of acyl side chain), 2.45 -2.23 (t, 6, CH_2 protons α to carboxy group of fatty chain), 1.8-1.2 (m, 70, unresolvable signals from CH_2 protons of fatty acid chain), 1.2-1.0 (m, 7, CH_3 protons on the end of the acyl side chain), 0.95-0.72 (t, 9, CH_3 protons on the end of the fatty chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76.5-75.5 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 34.1-22.6 (multiple signals from fatty carbon chain and acyl side chain), 19.4 (CH_3 end carbons of acyl side chain), 14.1-13.9 (CH_3 end carbon of fatty chain). The spectral peaks and assignments are close to computed chemical shift and in correct order.

The VSO1 ^{1}H NMR: (500 MHz, $CDCl_3$, ppm): δ 5.26 (t, 1, CH proton of –CH_2-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 1.5, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 5.4, CH protons of the epoxy ring), 2.5 -2.23 (t, 7.2, CH_2 protons

α to carboxy group of fatty chain and acyl side chain), 1.8-1.2 (m, 72.9, unresolvable signals from CH_2 protons of fatty acid chain and acyl side chain), 0.95-0.72 (t, 11.6, CH_3 protons on the end of the fatty chain and acyl side chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76-75 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 34.1-22.5 (multiple signals from fatty carbon chain and acyl side chain), 22.0 (CH_2 α to end carbons of acyl side chain), 14.1-13.9 (CH_3 end carbon of fatty chain and acyl side chain). The spectral peaks and assignments are close to computed chemical shift and in correct order.

The HxSO1 ^1H NMR: (500 MHz, $CDCl_3$, ppm): (500 MHz, $CDCl_3$): δ 5.26 (t, 1, CH proton of –CH_2-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 2.5, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 4.7, CH protons of the epoxy ring), 2.5 - 2.23 (t, 7.8 CH_2 protons α to carboxy group of fatty chain and acyl side chain), 1.8-1.2 (m, 73.6, unresolvable signals from CH_2 protons of fatty acid chain and acyl side chain), 0.95-0.72 (t, 13.1, CH_3 protons on the end of the fatty chain and acyl side chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.3, 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76-75 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), δ 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 34.7-22.5 (multiple signals from fatty carbon chain and acyl side chain), 22.3 (CH_2 α to end carbons of acyl side chain), 14.1-13.9 (CH_3 end carbon of fatty chain and acyl side chain). The reaction product of large scale synthesis also provided similar

FTIR, ^{1}H and ^{13}C NMR spectra. The spectral peaks and assignments are close to computed chemical shift and in correct order.

The HpSO1 ^{1}H NMR: (500 MHz, $CDCl_{3,}$ ppm): (500 MHz, $CDCl_3$): δ 5.26 (t, 1, CH proton of $–CH_2$-C**H**-CH_2- glycerol backbone), 5.4-4.6 (m, 1.2, CH protons, at the point of substitution -CH-O-acyl, in fatty acid chain), 4.32-4.08 (m, 4, CH_2 proton of –C**H**$_2$-CH-C**H**$_2$- glycerol backbone), 3.2-2.8 (m, 5.4, CH protons of the epoxy ring), 2.5 - 2.23 (t, 8.1, CH_2 protons α to carboxy group of fatty chain and acyl side chain), 1.8-1.2 (m, 80.7, unresolvable signals from CH_2 protons of fatty acid chain and acyl side chain), 0.95-0.72 (t, 12.8, CH_3 protons on the end of the fatty chain and acyl side chain). ^{13}C NMR: (125 MHz, $CDCl_3$) δ 173.2 (carbonyl carbon of fatty chain), 172.7 (carbonyl carbon of acyl side chain), 76-75 (fatty acid carbon of branching site –**C**H-O-acyl), 68.9 (glycerol CH carbon), 62.1 (glycerol CH_2 carbon), 54.1-57.2 (epoxy carbons), 34.7-22.5 (multiple signals from fatty carbon chain and acyl side chain), 14.1-13.9 (CH_3 end carbon of fatty chain and acyl side chain). The spectral peaks and assignments are close to computed chemical shift and in correct order.