

Supporting Information

Lipophilic Pyrylium Salts in the Synthesis of Efficient Pyridinium-based Cationic Lipids, Gemini Surfactants, and Lipophilic Oligomers for Gene Delivery

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Summary:

1. Complete characterization of the investigated compounds;
2. Elemental analysis data for the compounds described in the paper

1. Characterization of the investigated compounds

4,6-Dimethyl-2-decylpyrylium hexafluorophosphate 14a: mp 67.6 °C; Yield 27%; ¹H-NMR (CDCl₃), δ, ppm: 7.70 (d, *J* = 1.7 Hz, 1H, H-5 pyrylium), 7.62 (d, *J* = 1.7 Hz, 1H, H-3 pyrylium), 3.07 (t, *J* = 7.8 Hz, 2H, Cα-CH₂), 2.86 (s, 3H, CH₃ α-pyrylium), 2.69 (s, 3H, CH₃ γ-pyrylium), 1.82 (quin, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂), 1.40 (m, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 12H, 6 CH₂ from n-alkyl chain), 0.88 (t, *J* = 6.7 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ, ppm: 181.0 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.7 (Cα-CH₂-), 31.8, 29.4, 29.3, 29.2, 29.0 (2C), 27.0 (all from n-alkyl chain), 23.5 (CH₃ γ-pyrylium), 22.6 (n-alkyl chain), 21.1 (CH₃ α-pyrylium), 14.0 (CH₃ from n-alkyl chain). Anal. (C₁₇H₂₉O⁺ PF₆⁻), C, H.

4,6-Dimethyl-2-undecylpyrylium hexafluorophosphate 14b: mp 62.8 °C; Yield 21%; ¹H-NMR (CDCl₃), δ, ppm: 7.70 (d, *J* = 1.8 Hz, 1H, H-5 pyrylium), 7.62 (d, *J* = 1.8 Hz, 1H, H-3 pyrylium), 3.06 (t, *J* = 7.8 Hz, 2H, Cα-CH₂), 2.85 (s, 3H, CH₃ α-pyrylium), 2.68 (s, 3H, CH₃ γ-pyrylium), 1.83 (quin, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂), 1.40 (m, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 14H, 7 CH₂ from n-alkyl chain), 0.87 (t, *J* = 6.7 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ, ppm: 180.9 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.6 (Cα-CH₂-), 31.8, 29.5, 29.3, 29.2, 29.0 (2C), 27.0 (all from n-alkyl chain), 23.4 (CH₃ γ-pyrylium), 22.6 (n-alkyl chain), 21.0 (CH₃ α-pyrylium), 14.0 (CH₃ from n-alkyl chain). Anal. (C₁₈H₃₁O⁺ PF₆⁻), C, H.

4,6-Dimethyl-2-dodecylpyrylium hexafluorophosphate 14c: mp 78.7 °C; Yield 31%; ¹H-NMR (CDCl₃), δ, ppm: 7.69 (d, *J* = 1.8 Hz, 1H, H-5 pyrylium), 7.61 (d, *J* = 1.8 Hz, 1H, H-3 pyrylium), 3.05 (t, *J* = 7.8 Hz, 2H, Cα-CH₂), 2.85 (s, 3H, CH₃ α-pyrylium), 2.68 (s, 3H, CH₃ γ-pyrylium), 1.80 (quin, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂), 1.40 (m, *J* = 7.7 Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 16H, 8 CH₂ from n-alkyl chain), 0.87 (t, *J* = 6.7 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ, ppm: 180.9 (C-2 pyrylium), 177.7 (C-

6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.6 (C α -CH₂-), 31.8, 29.6, 29.5, 29.3, 29.3, 29.0 (2C), 27.0 (all from n-alkyl chain), 23.5 (CH₃ γ -pyrylium), 22.6 (n-alkyl chain), 21.2 (CH₃ α -pyrylium), 14.1 (CH₃ from n-alkyl chain). Anal. (C₁₉H₃₃O⁺ PF₆⁻), C, H.

4,6-Dimethyl-2-tridecylpyrylium hexafluorophosphate 14d: mp 73.3 °C; Yield 19%; ¹H-NMR (CDCl₃), δ , ppm: 7.69 (s, 1H, H-5 pyrylium), 7.61 (s, 1H, H-3 pyrylium), 3.05 (t, J = 7.8 Hz, 2H, C α -CH₂), 2.84 (s, 3H, CH₃ α -pyrylium), 2.67 (s, 3H, CH₃ γ -pyrylium), 1.80 (quin, J = 7.7 Hz, 2H, C α -CH₂CH₂), 1.39 (m, J = 7.7 Hz, 2H, C α -CH₂CH₂CH₂), 1.25 (m, 18H, 9 CH₂ from n-alkyl chain), 0.87 (t, J = 6.7 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ , ppm: 180.8 (C-2 pyrylium), 177.6 (C-6 pyrylium), 174.6 (C-4 pyrylium), 123.7 (C-5 pyrylium), 122.4 (C-3 pyrylium), 34.5 (C α -CH₂-), 31.8, 29.6, 29.5, 29.5, 29.3, 29.2, 29.0 (2C), 26.9 (all from n-alkyl chain), 23.3 (CH₃ γ -pyrylium), 22.6 (n-alkyl chain), 20.9 (CH₃ α -pyrylium), 14.0 (CH₃ from n-alkyl chain). Anal. (C₂₀H₃₅O⁺ PF₆⁻), C, H.

4,6-Dimethyl-2-tetradecylpyrylium hexafluorophosphate 14e: mp 85.2 °C; Yield 32%; ¹H-NMR (CDCl₃), δ , ppm: 7.70 (s, 1H, H-5 pyrylium), 7.61 (s, 1H, H-3 pyrylium), 3.06 (t, J = 7.6 Hz, 2H, C α -CH₂), 2.86 (s, 3H, CH₃ α -pyrylium), 2.69 (s, 3H, CH₃ γ -pyrylium), 1.80 (quin, J = 7.6 Hz, 2H, C α -CH₂CH₂), 1.40 (m, J = 7.7 Hz, 2H, C α -CH₂CH₂CH₂), 1.25 (m, 20H, 10 CH₂ from n-alkyl chain), 0.87 (t, J = 6.8 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ , ppm: 180.9 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.7 (C α -CH₂-), 31.9, 29.6 (4C), 29.5, 29.3 (2C), 29.0 (2C), 27.0 (all from n-alkyl chain), 23.5 (CH₃ γ -pyrylium), 22.6 (n-alkyl chain), 21.1 (CH₃ α -pyrylium), 14.0 (CH₃ from n-alkyl chain). Anal. (C₂₁H₃₇O⁺ PF₆⁻), C, H.

4,6-Dimethyl-2-pentadecylpyrylium hexafluorophosphate 14f: mp 79.8 °C; Yield 25%; ¹H-NMR (CDCl₃), δ , ppm: 7.70 (s, 1H, H-5 pyrylium), 7.62 (s, 1H, H-3 pyrylium), 3.06 (t, J = 7.6 Hz, 2H, C α -CH₂), 2.86 (s, 3H, CH₃ α -pyrylium), 2.69 (s, 3H, CH₃ γ -pyrylium), 1.81 (quin, J = 7.6 Hz, 2H, C α -CH₂CH₂), 1.40 (m, J = 7.7 Hz, 2H, C α -CH₂CH₂CH₂), 1.25 (m, 22H, 11 CH₂ from n-alkyl chain), 0.88 (t, J = 6.8 Hz, 3H, CH₃

from n-alkyl chain); ^{13}C -NMR (CDCl_3), δ , ppm: 180.9 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.7 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.6 ($\text{C}\alpha\text{-CH}_2\text{-}$), 31.8, 29.7, 29.6, 29.5, 29.3, 29.0 (2C), 27.0 (all from n-alkyl chain), 23.4 ($\text{CH}_3\ \gamma\text{-pyrylium}$), 22.6 (n-alkyl chain), 21.1 ($\text{CH}_3\ \alpha\text{-pyrylium}$), 14.0 (CH_3 from n-alkyl chain). Anal. ($\text{C}_{22}\text{H}_{39}\text{O}^+ \text{PF}_6^-$), C, H.

4,6-Dimethyl-2-hexadecylpyrylium hexafluorophosphate 14g: mp 88.1 °C; Yield 26%; ^1H -NMR (CDCl_3), δ , ppm: 7.70 (s, 1H, H-5 pyrylium), 7.61 (s, 1H, H-3 pyrylium), 3.06 (t, $J = 7.6$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{-}$), 2.86 (s, 3H, $\text{CH}_3\ \alpha\text{-pyrylium}$), 2.69 (s, 3H, $\text{CH}_3\ \gamma\text{-pyrylium}$), 1.81 (quin, $J = 7.0$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{CH}_2\text{-}$), 1.40 (m, 2H, $\text{C}\alpha\text{-CH}_2\text{CH}_2\text{CH}_2\text{-}$), 1.25 (m, 24H, 12 CH_2 from n-alkyl chain), 0.87 (t, $J = 6.7$ Hz, 3H, CH_3 from n-alkyl chain); ^{13}C -NMR (CDCl_3), δ , ppm: 180.9 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.6 ($\text{C}\alpha\text{-CH}_2\text{-}$), 31.9, 29.7, 29.6, 29.5, 29.3, 29.3, 29.1 (2C), 27.0 (all from n-alkyl chain), 23.5 ($\text{CH}_3\ \gamma\text{-pyrylium}$), 22.6 (n-alkyl chain), 21.1 ($\text{CH}_3\ \alpha\text{-pyrylium}$), 14.1 (CH_3 from n-alkyl chain). Anal. ($\text{C}_{23}\text{H}_{41}\text{O}^+ \text{PF}_6^-$), C, H.

4,6-Dimethyl-2-heptadecylpyrylium hexafluorophosphate 14h: mp 81.8 °C; Yield 20%; ^1H -NMR (CDCl_3), δ , ppm: 7.71 (s, 1H, H-5 pyrylium), 7.61 (s, 1H, H-3 pyrylium), 3.07 (t, $J = 7.8$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{-}$), 2.86 (s, 3H, $\text{CH}_3\ \alpha\text{-pyrylium}$), 2.69 (s, 3H, $\text{CH}_3\ \gamma\text{-pyrylium}$), 1.81 (quin, $J = 7.6$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{CH}_2\text{-}$), 1.40 (m, $J = 7.7$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{CH}_2\text{CH}_2\text{-}$), 1.25 (m, 26H, 13 CH_2 from n-alkyl chain), 0.88 (t, $J = 6.6$ Hz, 3H, CH_3 from n-alkyl chain); ^{13}C -NMR (CDCl_3), δ , ppm: 180.9 (C-2 pyrylium), 177.7 (C-6 pyrylium), 174.7 (C-4 pyrylium), 123.8 (C-5 pyrylium), 122.5 (C-3 pyrylium), 34.7 ($\text{C}\alpha\text{-CH}_2\text{-}$), 31.9, 29.7, 29.6, 29.5, 29.3, 29.3, 29.1 (2C), 27.0 (all from n-alkyl chain), 23.5 ($\text{CH}_3\ \gamma\text{-pyrylium}$), 22.6 (n-alkyl chain), 21.1 ($\text{CH}_3\ \alpha\text{-pyrylium}$), 14.1 (CH_3 from n-alkyl chain). Anal. ($\text{C}_{24}\text{H}_{43}\text{O}^+ \text{PF}_6^-$), C, H.

4,6-Dimethyl-1,2-didecylpyridinium hexafluorophosphate 15: $T_c = 46.9$ °C; Yield 65%; ^1H -NMR (CDCl_3), δ , ppm: 7.47 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.35 (t, $J = 8.6$ Hz, 2H, $\text{N-CH}_2\text{-}$), 2.94 (t, $J = 8.0$ Hz, 2H, $\text{C}\alpha\text{-CH}_2\text{-}$), 2.78 (s, 3H, $\text{CH}_3\ \alpha\text{-pyridinium}$), 2.52 (s, 3H, $\text{CH}_3\ \gamma\text{-pyridinium}$), 1.76 (m, 4H, N- and $\text{C}\alpha\text{-}$

CH₂CH₂), 1.46 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 24H, 12 CH₂ from n-alkyl chains), 0.88 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.9 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.8, 31.8, 29.5, 29.4 (2C), 29.4, 29.3 (2C), 29.2, 29.2, 29.1, 28.9, 28.7, 26.6, 22.6 (2C), (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₂₇H₅₀N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-dodecyl-2-decylpyridinium hexafluorophosphate 16: T_c = 56.7 °C; Yield 71%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.35 (t, J = 8.4 Hz, 2H, N-CH₂), 2.94 (t, J = 8.0 Hz, 2H, C α -CH₂), 2.78 (s, 3H, CH₃ α -pyridinium), 2.51 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.46 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 28H, 14 CH₂ from n-alkyl chains), 0.88 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.9 (C-4 pyridinium), 157.2 (C-2 pyridinium), 153.9 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.6, 29.5, 29.4 (3C), 29.3 (4C), 29.2, 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₂₉H₅₄N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-decyl-2-undecylpyridinium hexafluorophosphate 17: T_c = 52.2 °C; Yield 69%; ¹H-NMR (CDCl₃), δ , ppm: 7.49 (d, J =2.0 Hz, 1H, H-5 pyridinium), 7.40 (d, J =2.0 Hz, 1H, H-3 pyridinium), 4.42 (t, J = 8.4 Hz, 2H, N-CH₂), 2.97 (t, J = 8.0 Hz, 2H, C α -CH₂), 2.83 (s, 3H, CH₃ α -pyridinium), 2.53 (s, 3H, CH₃ γ -pyridinium), 1.75 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.26 (m, 26H, 13 CH₂ from n-alkyl chains), 0.87 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.5 (C-4 pyridinium), 157.3 (C-2 pyridinium), 154.3 (C-6 pyridinium), 128.8 (C-5 pyridinium), 126.9 (C-3 pyridinium), 51.8 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 31.8, 29.5 (2C), 29.4 (3C), 29.3, 29.2, 29.1, 28.9, 28.6, 26.6, 22.7, 22.6 (all from n-alkyl chains), 21.6 (CH₃ γ -pyridinium), 21.1 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₂₈H₅₂N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-dodecyl-2-undecylpyridinium hexafluorophosphate 18: $T_c = 54.8\text{ }^\circ\text{C}$; Yield 60%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.47 (d, $J=2.3\text{ Hz}$, 1H, H-5 pyridinium), 7.40 (d, $J=2.3\text{ Hz}$, 1H, H-3 pyridinium), 4.36 (t, $J = 8.5\text{ Hz}$, 2H, N- $\underline{\text{CH}_2}$), 2.94 (t, $J = 8.0\text{ Hz}$, 2H, C α - $\underline{\text{CH}_2}$), 2.79 (s, 3H, CH_3 α -pyridinium), 2.52 (s, 3H, CH_3 γ -pyridinium), 1.75 (m, 4H, N- and C α - CH_2CH_2), 1.47 (m, 4H, N- and C α - $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.26 (m, 30H, 15 CH_2 from n-alkyl chains), 0.88 (t, $J = 6.8\text{ Hz}$, 6H, 2 CH_3 from n-alkyl chains); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 153.9 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N- $\underline{\text{CH}_2}$ -), 33.0 (C α - $\underline{\text{CH}_2}$ -), 31.9, 29.6 (2C), 29.4 (2C), 29.3 (3C), 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH_3 γ -pyridinium), 20.9 (CH_3 α -pyridinium), 14.1 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{30}\text{H}_{56}\text{N}^+ \text{PF}_6^-$), C, H, N.

4,6-Dimethyl-1-decyl-2-dodecylpyridinium hexafluorophosphate 19: $T_c = 57.6\text{ }^\circ\text{C}$; Yield 72%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.47 (d, $J = 2.0\text{ Hz}$, 1H, H-5 pyridinium), 7.40 (d, $J=2.0\text{ Hz}$, 1H, H-3 pyridinium), 4.35 (t, $J = 8.6\text{ Hz}$, 2H, N- $\underline{\text{CH}_2}$), 2.94 (t, $J = 8.0\text{ Hz}$, 2H, C α - $\underline{\text{CH}_2}$), 2.78 (s, 3H, CH_3 α -pyridinium), 2.51 (s, 3H, CH_3 γ -pyridinium), 1.76 (m, 4H, N- and C α - CH_2CH_2), 1.48 (m, 4H, N- and C α - $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.26 (m, 28H, 14 CH_2 from n-alkyl chains), 0.87 (t, $J = 6.8\text{ Hz}$, 6H, 2 CH_3 from n-alkyl chains); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 157.9 (C-4 pyridinium), 157.2 (C-2 pyridinium), 153.9 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N- $\underline{\text{CH}_2}$ -), 33.0 (C α - $\underline{\text{CH}_2}$ -), 31.9, 31.8, 29.6 (2C), 29.5, 29.4 (2C), 29.3 (2C), 29.2, 29.1, 28.9, 28.7, 26.6, 22.6 (2C) (all from n-alkyl chains), 21.5 (CH_3 γ -pyridinium), 20.9 (CH_3 α -pyridinium), 14.1 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{29}\text{H}_{54}\text{N}^+ \text{PF}_6^-$), C, H, N.

4,6-Dimethyl-1,2-didodecylpyridinium hexafluorophosphate 20: $T_c = 58.6\text{ }^\circ\text{C}$; Yield 63%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.46 (d, $J=2.0\text{ Hz}$, 1H, H-5 pyridinium), 7.40 (d, $J = 2.0\text{ Hz}$, 1H, H-3 pyridinium), 4.35 (t, $J = 8.5\text{ Hz}$, 2H, N- $\underline{\text{CH}_2}$), 2.93 (t, $J = 8.0\text{ Hz}$, 2H, C α - $\underline{\text{CH}_2}$), 2.78 (s, 3H, CH_3 α -pyridinium), 2.51 (s, 3H, CH_3 γ -pyridinium), 1.76 (m, 4H, N- and C α - CH_2CH_2), 1.47 (m, 4H, N- and C α - $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.25 (m, 32H, 16 CH_2 from n-alkyl chains), 0.87 (t, $J = 6.8\text{ Hz}$, 6H, 2 CH_3 from n-alkyl chains); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 153.9 (C-6 pyridinium), 128.9

(C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (Cα-CH₂-), 31.9, 29.6, 29.5 (2C), 29.4 (3C), 29.3 (5C), 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ-pyridinium), 20.9 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₁H₅₈N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-decyl-2-tridecylpyridinium hexafluorophosphate 21: T_c = 58.4 °C; Yield 59%; ¹H-NMR (CDCl₃), δ, ppm: 7.46 (d, *J* = 2.0 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.0 Hz, 1H, H-3 pyridinium), 4.35 (t, *J* = 8.5 Hz, 2H, N-CH₂), 2.93 (t, *J* = 8.0 Hz, 2H, Cα-CH₂), 2.78 (s, 3H, CH₃ α-pyridinium), 2.51 (s, 3H, CH₃ γ-pyridinium), 1.76 (m, 4H, N- and Cα-CH₂CH₂), 1.47 (m, 4H, N- and Cα-CH₂CH₂CH₂), 1.25 (m, 30H, 15 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 153.4 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (Cα-CH₂-), 31.9, 31.8, 29.6, 29.5, 29.4 (3C), 29.3 (3C), 29.2, 29.1, 28.9, 28.7 (2C), 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ-pyridinium), 20.9 (CH₃ α-pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₃₀H₅₆N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-dodecyl-2-tridecylpyridinium hexafluorophosphate 22: T_c = 67.2 °C; Yield 62%; ¹H-NMR (CDCl₃), δ, ppm: 7.47 (d, *J* = 2.2 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.2 Hz, 1H, H-3 pyridinium), 4.35 (t, *J* = 8.5 Hz, 2H, N-CH₂), 2.94 (t, *J* = 8.0 Hz, 2H, Cα-CH₂), 2.79 (s, 3H, CH₃ α-pyridinium), 2.52 (s, 3H, CH₃ γ-pyridinium), 1.76 (m, 4H, N- and Cα-CH₂CH₂), 1.47 (m, 4H, N- and Cα-CH₂CH₂CH₂), 1.25 (m, 34H, 17 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (Cα-CH₂-), 31.9, 31.8, 29.7, 29.6, 29.5 (2C), 29.4 (2C), 29.3 (4C), 29.1, 28.9, 28.6, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ-pyridinium), 20.9 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₂H₆₀N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1,2-ditetradecylpyridinium hexafluorophosphate 23: T_c = 68.5 °C; Yield 70%; ¹H-NMR (CDCl₃), δ, ppm: 7.47 (d, *J* = 2.0 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.0 Hz, 1H, H-3 pyridinium), 4.35 (t, *J* = 8.4 Hz, 2H, N-CH₂), 2.94 (t, *J* = 8.0 Hz, 2H,

C α -CH₂), 2.78 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 40H, 20 CH₂ from n-alkyl chains), 0.88 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.6 (4C), 29.4 (5C), 29.3, 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₅H₆₆N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-tetradecyl-2-pentadecylpyridinium hexafluorophosphate 24: T_c = 74.7 °C; Yield 61%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (d, J = 2.0 Hz, 1H, H-5 pyridinium), 7.40 (d, J = 2.0 Hz, 1H, H-3 pyridinium), 4.35 (t, J = 8.4 Hz, 2H, N-CH₂), 2.94 (t, J = 8.0 Hz, 2H, C α -CH₂), 2.78 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 42H, 21 CH₂ from n-alkyl chains), 0.87 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.0 (C-2 pyridinium), 154.0 (C-6 pyridinium), 129.0 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.7, 29.6, 29.6 (2C), 29.4 (5C), 29.3, 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₆H₆₈N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-hexadecyl-2-pentadecylpyridinium hexafluorophosphate 25: T_c = 74.1 °C; Yield 63%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (d, J = 2.2 Hz, 1H, H-5 pyridinium), 7.40 (d, J = 2.2 Hz, 1H, H-3 pyridinium), 4.36 (t, J = 8.4 Hz, 2H, N-CH₂), 2.94 (t, J = 8.0 Hz, 2H, C α -CH₂), 2.79 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 46H, 23 CH₂ from n-alkyl chains), 0.87 (t, J = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.7, 29.6 (2C), 29.5, 29.4 (5C), 29.3, 29.1, 28.9, 28.6, 26.6, 22.6 (all from

n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₈H₇₂N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1,2-dihexadecylpyridinium hexafluorophosphate 26: T_c = 76.2 °C; Yield 59%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (d, *J* = 2.0 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.0 Hz, 1H, H-3 pyridinium), 4.35 (t, *J* = 8.4 Hz, 2H, N-CH₂), 2.94 (t, *J* = 8.0 Hz, 2H, C α -CH₂), 2.79 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 48H, 24 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.7 (2C), 29.6 (2C), 29.5, 29.4 (2C), 29.3 (2C), 29.1, 28.9, 28.6, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₉H₇₄N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-hexadecyl-2-heptadecylpyridinium hexafluorophosphate 27: T_c = 82.2 °C; Yield 71%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (d, *J* = 2.1 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.1 Hz, 1H, H-3 pyridinium), 4.36 (t, *J* = 8.4 Hz, 2H, N-CH₂), 2.94 (t, *J* = 8.0 Hz, 2H, C α -CH₂), 2.79 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 50H, 25 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.7 (2C), 29.6 (3C), 29.4 (2C), 29.3 (2C), 29.1, 28.9, 28.6, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₄₀H₇₆N⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-1-octadecyl-2-heptadecylpyridinium hexafluorophosphate 28: T_c = 82.1 °C; Yield 65%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (d, *J* = 2.1 Hz, 1H, H-5 pyridinium), 7.40 (d, *J* = 2.1 Hz, 1H, H-3 pyridinium), 4.35 (t, *J* = 8.4 Hz, 2H, N-CH₂), 2.94 (t, *J* = 8.0 Hz, 2H, C α -CH₂), 2.79 (s, 3H, CH₃ α -pyridinium), 2.52 (s, 3H, CH₃ γ -pyridinium), 1.76 (m, 4H, N- and C α -CH₂CH₂), 1.47 (m, 4H, N- and C α -CH₂CH₂CH₂), 1.25 (m, 54H, 27

CH₂ from n-alkyl chains), 0.88 (t, $J = 6.8$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (C-4 pyridinium), 157.2 (C-2 pyridinium), 154.0 (C-6 pyridinium), 128.9 (C-5 pyridinium), 127.2 (C-3 pyridinium), 51.7 (N-CH₂-), 33.0 (C α -CH₂-), 31.9, 29.7 (2C), 29.6 (4C), 29.5 (2C), 29.4 (3C), 29.3 (4C), 29.1, 28.9, 28.7, 26.6, 22.6 (all from n-alkyl chains), 21.5 (CH₃ γ -pyridinium), 20.9 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₄₂H₈₀N⁺ PF₆⁻), C, H, N.

1,2-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)ethane dihexafluorophosphate 29:

T_c = 178.2 °C; Yield 57%; ¹H-NMR (DMSO-d₆), δ , ppm: 7.83 (br. s, 2H, 2 H-5 pyridinium), 7.82 (br. s, 2H, 2 H-3 pyridinium), 5.02 (m, $J = 1.7$ Hz, 4H, 2 N-CH₂), 2.90 (t, $J = 7.9$ Hz, 4H, 2 C α -CH₂), 2.73 (d, $J = 2.7$ Hz, 6H, 2 CH₃ α -pyridinium), 2.55 (d, $J = 2.7$ Hz, 6H, 2 CH₃ γ -pyridinium), 1.69 (m, 4H, 2 C α -CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.85 (t, $J = 6.6$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (DMSO-d₆), δ , ppm: 158.9 (2 C-4 pyridinium), 158.3 (2 C-2 pyridinium), 155.3 (2 C-6 pyridinium), 128.7 (2 C-5 pyridinium), 126.9 (2 C-3 pyridinium), 48.7 (2 N-CH₂-), 32.5 (2 C α -CH₂-), 31.3 (2C), 29.12 (6C), 29.1 (4C), 29.0 (2C), 28.8 (2C), 28.7 (2C), 28.6 (2C), 27.7 (2C), 22.0 (2C), 21.0 (2 CH₃ γ -pyridinium), 20.9 (2 CH₃ α -pyridinium), 13.9 (2 CH₃ from n-alkyl chains). Anal. (C₄₄H₇₈N₂⁺ 2PF₆⁻), C, H, N.

1,3-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propane dihexafluorophosphate 30:

T_c = 186.6 °C; Yield 53%; ¹H-NMR (CDCl₃), δ , ppm: 7.43 (d, $J = 1.2$ Hz, 2H, 2 H-5 pyridinium), 7.35 (d, $J = 1.2$ Hz, 2H, 2 H-3 pyridinium), 4.66 (t, $J = 8.5$ Hz, 4H, 2 N-CH₂), 2.97 (t, $J = 7.9$ Hz, 4H, 2 C α -CH₂), 2.81 (s, 6H, 2 CH₃ α -pyridinium), 2.50 (s, 6H, 2 CH₃ γ -pyridinium), 2.31 (m, 2H, N-CH₂CH₂CH₂-N), 1.75 (dt, $J = 7.5, 8.0$ Hz, 4H, 2 C α -CH₂CH₂), 1.44 (m, 4H, 2 C α -CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.88 (t, $J = 6.8$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 158.3 (2 C-4 pyridinium), 157.8 (2 C-2 pyridinium), 154.6 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.0 (2 C-3 pyridinium), 47.6 (2 N-CH₂-), 33.0 (2 C α -CH₂-), 31.9 (2C), 29.7 (8C), 29.5 (2C), 29.4 (4C), 29.2 (4C), 28.5 (4C), 27.6 (N-CH₂CH₂CH₂-N), 22.7 (2C), 21.6 (2 CH₃ γ -pyridinium), 21.1 (2 CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₄₅H₈₀N₂⁺ 2PF₆⁻), C, H, N.

1,4-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)butane dihexafluorophosphate 31:

$T_c = 185.6\text{ }^\circ\text{C}$; Yield 57%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.39 (s, 2H, 2 H-5 pyridinium), 7.42 (s, 2H, 2 H-3 pyridinium), 4.49 (br. s, 4H, 2 N- CH_2), 3.04 (t, $J = 8.0\text{ Hz}$, 4H, 2 C α - CH_2), 2.83 (s, 6H, 2 CH_3 α -pyridinium), 2.54 (s, 6H, 2 CH_3 γ -pyridinium), 2.08 (m, 4H, 2 N- CH_2CH_2), 1.72 (cv, $J = 8.0\text{ Hz}$, 4H, 2 C α - CH_2CH_2), 1.44 (dt, $J = 7.4, 8.0\text{ Hz}$, 4H, 2 C α - $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.24 (m, 44H, 22 CH_2 from n-alkyl chains), 0.87 (t, $J = 6.8\text{ Hz}$, 6H, 2 CH_3 from n-alkyl chains); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 157.7 (2 C-4 pyridinium), 157.5 (2 C-2 pyridinium), 154.4 (2 C-6 pyridinium), 128.7 (2 C-5 pyridinium), 127.1 (2 C-3 pyridinium), 51.6 (2 N- CH_2 -), 33.1 (2 C α - CH_2 -), 31.9 (2C), 29.7 (4C), 29.65 (4C), 29.6 (2C), 29.4 (4C), 29.3 (2C), 29.2 (2C), 28.9 (2C), 28.8 (2C), 25.4 (2C), 22.6 (2C), 21.5 (2 CH_3 γ -pyridinium), 21.0 (2 CH_3 α -pyridinium), 14.0 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{46}\text{H}_{82}\text{N}_2^+ 2\text{PF}_6^-$), C, H, N.

1,5-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)pentane dihexafluorophosphate 32:

$T_c = 137.8\text{ }^\circ\text{C}$; Yield 62%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.45 (d, $J = 2.4\text{ Hz}$, 2H, 2 H-5 pyridinium), 7.35 (d, $J = 2.4\text{ Hz}$, 2H, 2 H-3 pyridinium), 4.40 (t, $J = 8.4\text{ Hz}$, 4H, 2 N- CH_2), 3.00 (t, $J = 8.0\text{ Hz}$, 4H, 2 C α - CH_2), 2.79 (s, 6H, 2 CH_3 α -pyridinium), 2.49 (s, 6H, 2 CH_3 γ -pyridinium), 1.88 (m, 4H, 2 N- CH_2CH_2), 1.71 (dt, $J = 7.5, 8.0\text{ Hz}$, 4H, 2 C α - CH_2CH_2), 1.60 (m, 2H, N- $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.42 (m, 4H, 2 C α - $\text{CH}_2\text{CH}_2\text{CH}_2$), 1.26 (m, 44H, 22 CH_2 from n-alkyl chains), 0.85 (t, $J = 6.8\text{ Hz}$, 6H, 2 CH_3 from n-alkyl chains); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 158.1 (2 C-2 pyridinium), 157.9 (2 C-4 pyridinium), 154.8 (2 C-6 pyridinium), 129.0 (2 C-5 pyridinium), 127.4 (2 C-3 pyridinium), 51.5 (2 N- CH_2 -), 33.1 (2 C α - CH_2 -), 32.1 (2C), 29.9 (8C), 29.6 (4C), 29.2 (4C), 29.0 (4C), 28.7 (2C), 28.5 (2 N- $\text{CH}_2\text{CH}_2\text{CH}_2$ -), 23.4 (N- $\text{CH}_2\text{CH}_2\text{CH}_2$ -), 22.9 (2C), 21.7 (2 CH_3 γ -pyridinium), 21.2 (2 CH_3 α -pyridinium), 14.3 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{47}\text{H}_{84}\text{N}_2^+ 2\text{PF}_6^-$), C, H, N.

1,6-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)hexane dihexafluorophosphate 33:

$T_c = 189.9\text{ }^\circ\text{C}$; Yield 52%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.42 (d, $J = 1.4\text{ Hz}$, 2H, 2 H-5 pyridinium), 7.36 (d, $J = 1.4\text{ Hz}$, 2H, 2 H-3 pyridinium), 4.42 (t, $J = 8.4\text{ Hz}$, 4H, 2 N- CH_2), 3.00 (t, $J = 7.9\text{ Hz}$, 4H, 2 C α - CH_2), 2.82 (s, 6H, 2 CH_3 α -pyridinium), 2.53 (s, 6H,

2 CH₃ γ-pyridinium), 1.88 (m, 4H, 2 N-CH₂CH₂), 1.75 (dt, *J* = 7.4, 8.0 Hz, 4H, 2 Cα-CH₂CH₂), 1.64 (m, 4H, 2 N-CH₂CH₂CH₂), 1.46 (dt, *J* = 7.5 Hz, 4H, 2 Cα-CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.89 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.7 (2 C-2 pyridinium), 157.5 (2 C-4 pyridinium), 154.4 (2 C-6 pyridinium), 128.7 (2 C-5 pyridinium), 127.1 (2 C-3 pyridinium), 51.6 (2 N-CH₂-), 33.1 (2 Cα-CH₂-), 31.9 (2C), 29.7 (4C), 29.6 (6C), 29.4 (4C), 29.3 (2C), 29.2 (2C), 28.9 (2C), 28.8 (2C N-CH₂CH₂CH₂-), 25.4 (2C N-CH₂CH₂CH₂-), 22.6 (2C), 21.5 (2 CH₃ γ-pyridinium), 21.0 (2 CH₃ α-pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₄₈H₈₆N₂⁺ 2PF₆⁻), C, H, N.

1,7-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)heptane dihexafluorophosphate

34: T_c = 83.6 °C; Yield 61%; ¹H-NMR (CDCl₃), δ, ppm: 7.46 (d, *J* = 2.0 Hz, 2H, 2 H-5 pyridinium), 7.37 (d, *J* = 2.0 Hz, 2H, 2 H-3 pyridinium), 4.37 (t, *J* = 8.4 Hz, 4H, 2 N-CH₂), 2.96 (t, *J* = 7.9 Hz, 4H, 2 Cα-CH₂), 2.79 (s, 6H, 2 CH₃ α-pyridinium), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 1.80 (m, 4H, 2 N-CH₂CH₂), 1.73 (dt, *J* = 7.5, 7.9 Hz, 4H, 2 Cα-CH₂CH₂), 1.50 (m, 4H, 2 N-CH₂CH₂CH₂), 1.44 (m, 4H, 2 Cα-CH₂CH₂CH₂), 1.33 (m, 2H, N-CH₂CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.7 (2 C-4 pyridinium), 157.4 (2 C-2 pyridinium), 154.3 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.2 (2 C-3 pyridinium), 51.6 (2 N-CH₂-), 33.0 (2 Cα-CH₂-), 31.9 (2C), 29.7 (8C), 29.4 (4C), 29.3 (4C), 29.2 (4C), 29.0 (4C), 28.8 (2C N-CH₂CH₂CH₂-), 27.8 (2C), 25.9, 22.7 (2C), 21.5 (2 CH₃ γ-pyridinium), 20.9 (2 CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₄₉H₈₈N₂⁺ 2PF₆⁻), C, H, N.

1,8-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)octane dihexafluorophosphate 35:

T_c = 68.8 °C; Yield 64%; ¹H-NMR (CDCl₃), δ, ppm: 7.45 (d, *J* = 2.1 Hz, 2H, 2 H-5 pyridinium), 7.37 (d, *J* = 2.1 Hz, 2H, 2 H-3 pyridinium), 4.37 (t, *J* = 8.4 Hz, 4H, 2 N-CH₂), 2.96 (t, *J* = 8.0 Hz, 4H, 2 Cα-CH₂), 2.80 (s, 6H, 2 CH₃ α-pyridinium), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 1.79 (m, 4H, 2 N-CH₂CH₂), 1.74 (dt, *J* = 7.4, 8.0 Hz, 4H, 2 Cα-CH₂CH₂), 1.50 (m, 4H, 2 N-CH₂CH₂CH₂), 1.43 (m, 4H, 2 Cα-CH₂CH₂CH₂), 1.34 (m, 4H, 2 N-CH₂CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.8

Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.7 (2 C-4 pyridinium), 157.3 (2 C-2 pyridinium), 154.3 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.2 (2 C-3 pyridinium), 51.7 (2 N-CH₂-), 33.03 (2 Cα-CH₂-), 31.9 (2C), 29.7 (10C), 29.4 (4C), 29.3 (4C), 29.2 (6C), 29.0 (2C), 28.8 (2C), 28.0 (2C N-CH₂-CH₂-), 25.9 (2C), 22.7 (2C), 21.5 (2 CH₃ γ-pyridinium), 21.0 (2 CH₃ α-pyridinium), 14.10 (2 CH₃ from n-alkyl chains). Anal. (C₅₀H₉₀N₂⁺ 2PF₆⁻), C, H, N.

***t*-Butyl-N,N-bis(2-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)ethylenyl) carbamate dihexafluorophosphate 40a:** T_c = 139.9 °C; Yield 84%; ¹H-NMR (CDCl₃), δ, ppm: 7.50 (d, *J* = 2.0 Hz, 1H, H-5 pyridinium), 7.45 (d, *J* = 2.0 Hz, 1H, H-5' pyridinium), 7.38 (d, *J* = 2.0 Hz, 1H, H-3 pyridinium), 7.35 (d, *J* = 2.0 Hz, 1H, H-3' pyridinium), 4.58 (t, *J* = 7.3 Hz, 4H, 2 N⁺-CH₂), 3.72 (t, *J* = 6.9 Hz, 2H, BocN-CH₂), 3.62 (t, *J* = 7.4 Hz, 2H, BocN-CH₂'), 3.14 (t, *J* = 7.8 Hz, 2H, CαPy-CH₂), 2.98 (t, *J* = 7.8 Hz, 2H, CαPy'-CH₂), 2.81 (s, 3H, CH₃ α-pyridinium), 2.80 (s, 3H, CH₃ α-pyridinium'), 2.53 (s, 3H, CH₃ γ-pyridinium), 2.51 (s, 3H, CH₃ γ-pyridinium'), 1.70 (m, 4H, 2 Cα-CH₂-CH₂), 1.43 (m, 4H, 2 Cα-CH₂-CH₂-CH₂), 1.37 (s, 9H, 3 CH₃ *t*-Bu), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.7 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 158.5 (C-4 pyridinium), 158.3 (C-4 pyridinium'), 157.8 (2 C-2 pyridinium), 154.9 (C-6 pyridinium), 154.9 (CO *t*-Bu), 154.8 (C-6 pyridinium'), 129.1 (C-5 pyridinium), 128.9 (C-5 pyridinium'), 127.3 (C-3 pyridinium), 127.2 (C-3 pyridinium), 82.4 (CH₃)₃C, Boc), 49.5 (N⁺-CH₂), 48.4 (N⁺-CH₂'), 46.5 (BocN-CH₂), 46.4 (BocN-CH₂'), 32.9 (2 CαPy-CH₂-), 31.8 (2C), 29.6 (10C), 29.5 (2C), 29.4, 29.3 (2C), 29.1 (4C), 28.5, 28.0 (3C (CH₃)₃C, Boc), 22.6 (2C), 21.5 (broad, 2 CH₃ γ-pyridinium), 21.1 (CH₃ α-pyridinium), 21.0 (CH₃ α-pyridinium'), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₅₁H₉₁N₃O₂⁺ 2PF₆⁻), C, H, N.

***t*-Butyl-N,N-bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl) carbamate dihexafluorophosphate 40b:** T_c = 134.4 °C; Yield 86%; ¹H-NMR (CDCl₃), δ, ppm: 7.45 (s, 2H, 2 H-5 pyridinium), 7.36 (s, 2H, 2 H-3 pyridinium), 4.39 (t, *J* = 7.7 Hz, 4H, 2 N⁺-CH₂), 3.46 (t, *J* = 6.6 Hz, 4H, 2 BocN-CH₂), 2.99 (t, *J* = 6.0 Hz, 4H, 2 CαPy-CH₂), 2.81 (s, 6H, 2 CH₃ α-pyridinium), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 2.07 (m, 4H, 2 N⁺-

CH₂CH₂), 1.70 (dt, $J = 7.5, 8.0$ Hz, 4H, 2 C α -CH₂CH₂), 1.37 (s, 9H, 3 CH₃ *t*-Bu), 1.44 (m, 4H, 2 C α -CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.8 (2 C-4 pyridinium), 157.7 (2 C-2 pyridinium), 155.4 (CO *t*-Bu), 154.5 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.1 (2 C-3 pyridinium), 80.5 ((CH₃)₃C, Boc), 49.3 (broad s., 2 N⁺-CH₂), 45.2 (broad s., 2 BocN-CH₂), 32.9 (2 C α Py-CH₂-), 31.9 (2C), 29.6 (10C), 29.5 (2C), 29.4, 29.3 (4C), 29.1 (2C), 28.8 (2C), 28.3 (3C (CH₃)₃C, Boc), 22.6 (2C), 21.5 (2 CH₃ γ -pyridinium), 20.9 (2 CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₅₃H₉₅N₃O₂⁺ 2PF₆⁻), C, H, N.

***t*-Butyl-N-(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl)-N-(4-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)butylenyl) carbamate dihexafluorophosphate 40c**: $T_c = 143.5$ °C; Yield 79%; ¹H-NMR (CDCl₃), δ , ppm: 7.47 (br. s, 2H, 2 H-5 pyridinium), 7.38 (br. s, 2H, 2 H-3 pyridinium), 4.39 (m, 4H, 2 N⁺-CH₂), 3.39 (t, $J = 6.7$ Hz, 2H, BocN-CH₂CH₂CH₂N⁺), 3.28 (m, 2H, BocN-CH₂CH₂CH₂CH₂N⁺), 2.96 (t, $J = 7.7$ Hz, 4H, 2 C α Py-CH₂), 2.79 (br. s, 6H, 2 CH₃ α -pyridinium), 2.50 (br. s, 6H, 2 CH₃ γ -pyridinium), 2.03 (m, 2H, N⁺-CH₂CH₂CH₂N-Boc), 1.73 (m, 8H, 2 C α -CH₂CH₂ + N⁺-CH₂CH₂CH₂CH₂N-Boc + N⁺-CH₂CH₂CH₂CH₂N-Boc), 1.44 (s, 9H, 3 CH₃ *t*-Bu), 1.43 (m, 4H, 2 C α -CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.86 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.9 (C-4 pyridinium), 157.8 (C-4 pyridinium), 157.4 (C-2 pyridinium'), 155.4 (CO *t*-Bu), 154.3 (2 C-6 pyridinium), 128.9 (C-5 pyridinium), 128.8 (C-5 pyridinium'), 127.2 (C-3 pyridinium), 127.1 (C-3 pyridinium'), 80.1 ((CH₃)₃C, Boc), 51.3 (N⁺-CH₂CH₂CH₂N-Boc), 49.3 (br. s, N⁺-CH₂CH₂CH₂CH₂N-Boc), 44.5 (br. s, 2 BocN-CH₂), 32.9 (C α Py-CH₂-), 32.8 (C α Py'-CH₂-), 31.8 (2C), 29.6 (10C), 29.5 (2C), 29.4, 29.3 (2C), 29.2 (4C), 28.7 (2C), 28.3 (3C (CH₃)₃C, Boc), 26.5, 22.6 (2C), 21.4 (br. s, 2 CH₃ γ -pyridinium), 20.8 (br. s, 2 CH₃ α -pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₅₄H₉₇N₃O₂⁺ 2PF₆⁻), C, H, N.

N,N'-di-*t*-Butyloxycarbonyl-N,N'-bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propyl)butanediamine dihexafluorophosphate 46: $T_c = 103.3$ °C; Yield 81%; ¹H-NMR (CDCl₃), δ , ppm: 7.45 (br. s, 2H, 2 H-5 pyridinium), 7.37 (br. s, 2H, 2 H-3

pyridinium), 4.42 (m, 4H, 2 N⁺-CH₂), 3.39 (m, 4H, BocN-CH₂CH₂CH₂N⁺), 3.23 (m, 4H, BocN-CH₂CH₂CH₂CH₂NBoc), 2.97 (t, *J* = 7.7 Hz, 4H, 2 CαPy-CH₂), 2.80 (s, 6H, 2 CH₃ α-pyridinium), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 2.06 (m, 4H, N⁺-CH₂CH₂CH₂N-Boc), 1.74 (m, 4H, 2 Cα-CH₂CH₂), 1.54 (m, 4H, BocN-CH₂CH₂CH₂CH₂NBoc), 1.44 (s, 9H, 3 CH₃ *t*-Bu), 1.43 (m, 4H, 2 Cα-CH₂CH₂CH₂), 1.25 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.7 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.9 (br. s, 2 C-4 pyridinium), 157.5 (br. s, 2 C-2 pyridinium), 156.1 (2 CO *t*-Bu), 154.8 (2 C-6 pyridinium), 129.2 (2 C-5 pyridinium), 127.5 (2 C-3 pyridinium), 80.2 (2 (CH₃)₃C, Boc), 50.1 (br. s., 2 N⁺-CH₂CH₂CH₂N-Boc), 48.9 (br. s., 2 N⁺-CH₂CH₂CH₂N-Boc), 44.5 (br. s, BocN-CH₂CH₂CH₂CH₂NBoc), 33.3 (2 CαPy-CH₂-), 32.2 (2C), 30.0 (8C), 29.9 (2C), 29.8 (2C), 29.7 (2C), 29.6 (4C), 29.2 (2C), 28.7 (6C 2 (CH₃)₃C, Boc), 26.4 (br. s, 2 N⁺-CH₂CH₂CH₂N-Boc), 25.7 (br. s, BocN-CH₂CH₂CH₂CH₂NBoc), 23.00 (2C), 21.9 (2 CH₃ γ-pyridinium), 21.3 (2 CH₃ α-pyridinium), 14.4 (2 CH₃ from n-alkyl chains). Anal. (C₆₂H₁₁₂N₄O₄⁺ 2PF₆⁻), C, H, N.

N,N-Bis(2-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)ethylenyl)amine

dihexafluorophosphate 41a: T_c = 65.1 °C; Yield 49%; ¹H-NMR (CDCl₃), δ, ppm: 7.47 (s, 2H, 2 H-5 pyridinium), 7.35 (s, 2H, 2 H-3 pyridinium), 4.80 (t, *J* = 7.1 Hz, 4H, 2 N⁺-CH₂), 3.46 (br. s, 1H, NH), 3.26 (t, *J* = 7.1 Hz, 4H, 2 HN-CH₂), 3.14 (t, *J* = 7.7 Hz, 4H, 2 CαPy-CH₂), 3.02 (s, 6H, 2 CH₃ α-pyridinium), 2.50 (s, 6H, 2 CH₃ γ-pyridinium), 1.67 (cv, *J* = 7.7 Hz, 4H, 2 Cα-CH₂CH₂), 1.43 (cv, *J* = 7.6 Hz, 4H, 2 Cα-CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.83 (t, *J* = 6.7 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 158.7 (2 C-2 pyridinium), 157.3 (2 C-4 pyridinium), 155.5 (2 C-6 pyridinium), 128.6 (2 C-5 pyridinium), 127.2 (2 C-3 pyridinium), 51.4 (2 N⁺-CH₂), 47.7 (2 HN-CH₂), 33.7 (2 CαPy-CH₂-), 31.8 (2C), 29.6 (4C), 29.5 (6C), 29.3 (8C), 29.0 (2C), 22.6 (2 CH₃ γ-pyridinium), 22.5 (2C), 21.7 (2 CH₃ α-pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₄₆H₈₃N₃⁺ 2PF₆⁻), C, H, N.

N,N-Bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl)amine

dihexafluorophosphate 41b: T_c = 45.4 °C; Yield 52%; ¹H-NMR (CDCl₃), δ, ppm: 7.45 (s, 2H, 2 H-5 pyridinium), 7.36 (s, 2H, 2 H-3 pyridinium), 4.55 (t, *J* = 8.1 Hz, 4H, 2 N⁺-

CH₂), 3.01 (t, $J = 7.8$ Hz, 4H, 2 C α Py-CH₂), 2.84 (s, 6H, 2 CH₃ α -pyridinium), 2.78 (t, $J = 6.1$ Hz, 4H, 2 BocN-CH₂), 2.51 (s, 6H, 2 CH₃ γ -pyridinium), 1.96 (m, 4H, 2 N⁺-CH₂CH₂), 1.74 (cv, $J = 8.0$ Hz, 4H, 2 C α -CH₂CH₂), 1.72 (s, 1H, NH), 1.43 (cv, $J = 7.7$ Hz, 4H, 2 C α -CH₂CH₂CH₂), 1.26 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 157.7 (2 C-2 pyridinium), 157.5 (2 C-4 pyridinium), 154.7 (2 C-6 pyridinium), 128.7 (2 C-5 pyridinium), 127.0 (2 C-3 pyridinium), 50.5 (2 N⁺-CH₂), 46.5 (2 HN-CH₂), 32.9 (2 C α Py-CH₂-), 31.9 (2C), 29.7 (2C), 29.6 (6C), 29.5 (2C), 29.4 (2C), 29.3 (4C), 29.2 (2C), 29.1 (2C), 28.7 (2C), 22.6 (2C), 21.5 (2 CH₃ γ -pyridinium), 20.9 (2 CH₃ α -pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₄₈H₈₇N₃⁺ 2PF₆⁻), C, H, N.

N-(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl)-N-(4-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)butylenyl)amine dihexafluorophosphate 41c: $T_c = 67.2$ °C; Yield 47%; ¹H-NMR (CDCl₃), δ , ppm: 7.55 (s, 1H, H-5 pyridinium), 7.52 (s, 1H, H-5 pyridinium'), 7.32 (br. s, 2H, 2 H-3 pyridinium), 4.92 (t, $J = 8.8$ Hz, 2H, N⁺-CH₂CH₂CH₂NH), 4.61 (t, $J = 7.7$ Hz, 2H, N⁺-CH₂CH₂CH₂CH₂NH), 3.33 (t, $J = 6.7$ Hz, 2H, HN-CH₂CH₂CH₂CH₂N⁺), 3.16 (m, $J = 6.8, 7.6$ Hz, 6H, HN-CH₂CH₂CH₂CH₂N⁺ + 2 C α Py-CH₂), 3.04 (s, 3H, CH₃ α -pyridinium), 3.05 (s, 3H, CH₃ α -pyridinium'), 2.53 (m, 2H, N⁺-CH₂CH₂CH₂NH), 2.49 (br. s, 6H, 2 CH₃ γ -pyridinium), 2.14 (m, 4H, N⁺-CH₂CH₂CH₂CH₂NH + N⁺-CH₂CH₂CH₂CH₂NH), 1.70 (cv, $J = 7.8$ Hz, 8H, 2 C α -CH₂CH₂), 1.43 (m, 4H, 2 C α -CH₂CH₂CH₂), 1.24 (m, 44H, 22 CH₂ from n-alkyl chains), 0.82 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 158.3 (C-2 pyridinium), 157.7 (C-2 pyridinium'), 157.4 (C-4 pyridinium), 157.3 (C-4 pyridinium'), 155.5 (C-6 pyridinium), 155.3 (C-6 pyridinium'), 128.9 (C-5 pyridinium), 128.7 (C-5 pyridinium'), 126.7 (2 C-3 pyridinium), 57.9 (N⁺-CH₂CH₂CH₂CH₂NH), 51.7 (N⁺-CH₂CH₂CH₂CH₂NH), 50.1 (HN-CH₂CH₂CH₂CH₂N⁺), 47.3 (HN-CH₂CH₂CH₂N⁺), 45.1 (HN-CH₂CH₂), 33.2 (2 C α Py-CH₂-), 31.8 (2C), 29.5 (10C), 29.3 (8C), 28.9 (2C), 26.6 (2C), 26.0, 23.2 (2C), 22.5 (2C), 22.4 (CH₃ γ -pyridinium), 22.3 (CH₃ γ -pyridinium'), 21.7 (br. s, 2 CH₃ α -pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₄₉H₈₉N₃⁺ 2PF₆⁻), C, H, N.

N,N'-Bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propyl)butanediamine

dihexafluorophosphate 47: amorphous; glass transition at 9.6 °C; Yield 45%; ¹H-NMR (CDCl₃), δ, ppm: 7.46 (s, 2H, 2 H-5 pyridinium), 7.37 (s, 2H, 2 H-3 pyridinium), 4.42 (t, 4H, *J* = 8.0 Hz, 2 N⁺-CH₂), 3.01 (t, *J* = 7.8 Hz, 4H, 2 CαPy-CH₂), 2.82 (s, 6H, 2 CH₃ α-pyridinium), 2.78 (t, 4H, *J* = 6.4 Hz, 2 HN-CH₂CH₂CH₂N⁺), 2.65 (m, 4H, HN-CH₂CH₂CH₂CH₂NH), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 1.95 (m, 4H, N⁺-CH₂CH₂CH₂NH), 1.73 (cv, *J* = 7.7 Hz, 4H, 2 Cα-CH₂CH₂), 1.56 (m, 4H, HN-CH₂CH₂CH₂CH₂NH), 1.44 (cv, *J* = 7.3 Hz, 4H, 2 Cα-CH₂CH₂CH₂), 1.25 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, *J* = 6.7 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 157.9 (2 C-4 pyridinium), 157.8 (2 C-2 pyridinium), 154.7 (2 C-6 pyridinium), 129.2 (2 C-5 pyridinium), 127.5 (2 C-3 pyridinium), 50.4 (2 N⁺-CH₂CH₂CH₂NH), 49.5 (2 N⁺-CH₂CH₂CH₂N-Boc), 45.8 (HN-CH₂CH₂CH₂CH₂NH), 33.3 (2 CαPy-CH₂-), 32.5 (2C), 30.0 (8C), 29.9 (2C), 29.8 (2C), 29.7 (2C), 29.6 (2C), 29.5 (2C), 29.2 (2C), 27.8 (2 N⁺-CH₂CH₂CH₂NH), 23.0 (2C), 21.9 (2 CH₃ γ-pyridinium), 21.3 (2 CH₃ α-pyridinium), 14.4 (2 CH₃ from n-alkyl chains). Anal. (C₅₂H₉₆N₄⁺ 2PF₆⁻), C, H, N.

N,N'-Bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propyl)butane-N,N'-

bismyristoylamide dihexafluorophosphate 48a: T_c = 125.8 °C; Yield 55%; ¹H-NMR (CDCl₃), δ, ppm: 7.39 (br. s, 2H, 2 H-5 pyridinium), 7.32 (br. s, 2H, 2 H-3 pyridinium), 4.48 (m, 4H, 2 N⁺-CH₂), 3.57 (t, 4H, *J* = 6.6 Hz, MyristoylN-CH₂CH₂CH₂N⁺), 3.39 (m, 4H, MyristoylN-CH₂CH₂CH₂CH₂NMyristoyl), 3.02 (t, *J* = 7.7 Hz, 4H, 2 CαPy-CH₂), 2.85 (s, 6H, 2 CH₃ α-pyridinium), 2.53 (s, 6H, 2 CH₃ γ-pyridinium), 2.33 (t, *J* = 7.7 Hz, 4H, 2 NCOCH₂), 2.12 (m, 4H, N⁺-CH₂CH₂CH₂NMyristoyl), 1.74 (cv, *J* = 7.7 Hz, 4H, 2 Cα-CH₂CH₂), 1.62 (m, 8H, 2 NCOCH₂CH₂+ MyristoylN-CH₂CH₂CH₂CH₂NMyristoyl), 1.45 (m, 4H, 2 Cα-CH₂CH₂CH₂), 1.25 (m, 84H, 42 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.8 Hz, 12H, 4 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 174.1 (2 CO Myristoyl), 158.4 (2 C-4 pyridinium), 157.5 (2 C-2 pyridinium), 155.4 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.2 (2 C-3 pyridinium), 50.2 (br. s, 2 N⁺-CH₂CH₂CH₂NMyristoyl), 49.2 (br. s, 2 N⁺-CH₂CH₂CH₂NMyristoyl), 44.1 (br. s, MyristoylN-CH₂CH₂CH₂CH₂NMyristoyl), 33.2 (2 CαPy-CH₂-), 32.3 (4C), 30.1 (12C),

30.0 (8C), 29.9 (4C), 29.8 (4C), 29.7 (2C), 29.4 (4C), 29.1 (2C), 25.7 (2C), 23.0 (4C), 22.0 (2 CH₃ γ-pyridinium), 21.5 (2 CH₃ α-pyridinium), 14.5 (4 CH₃ from n-alkyl chains). Anal. (C₈₀H₁₄₈N₄⁺ 2PF₆⁻), C, H, N.

N,N'-Bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl)butane-N,N'-

bispamitoylamide dihexafluorophosphate 48b: T_c = 124.9 °C; Yield 62%; ¹H-NMR (CDCl₃), δ, ppm: 7.41 (br. s, 2H, 2 H-5 pyridinium), 7.33 (br. s, 2H, 2 H-3 pyridinium), 4.47 (m, 4H, 2 N⁺-CH₂), 3.55 (t, 4H, J = 6.6 Hz, PalmitoylN-CH₂CH₂CH₂N⁺), 3.38 (m, 4H, PalmitoylN-CH₂CH₂CH₂CH₂NPalmitoyl), 3.00 (t, J = 7.7 Hz, 4H, 2 CαPy-CH₂), 2.84 (s, 6H, 2 CH₃ α-pyridinium), 2.51 (s, 6H, 2 CH₃ γ-pyridinium), 2.32 (t, J = 7.3 Hz, 4H, 2 NCOCH₂), 2.11 (m, 4H, N⁺-CH₂CH₂CH₂NPalmitoyl), 1.74 (m, 4H, 2 Cα-CH₂CH₂), 1.62 (m, 8H, 2 NCOCH₂CH₂+ PalmitoylN-CH₂CH₂CH₂CH₂NPalmitoyl), 1.44 (m, 4H, 2 Cα-CH₂CH₂CH₂), 1.25 (m, 96H, 48 CH₂ from n-alkyl chains), 0.88 (t, J = 6.8 Hz, 12H, 4 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 174.1 (2 CO Palmitoyl), 158.2 (2 C-4 pyridinium), 157.7 (2 C-2 pyridinium), 155.2 (2 C-6 pyridinium), 127.2 (2 C-3 pyridinium), 120.0 (2 C-5 pyridinium), 50.2 (br. s, 2 N⁺-CH₂CH₂CH₂NPalmitoyl), 49.2 (br. s, 2 N⁺-CH₂CH₂CH₂NPalmitoyl), 44.1 (br. s, PalmitoylN-CH₂CH₂CH₂CH₂NPalmitoyl), 33.4 (2 CαPy-CH₂-), 33.1 (2 NCOCH₂), 32.3 (4C), 30.0 (18C), 29.9 (8C), 29.8 (2C), 29.7 (4C), 29.6 (2C), 29.5 (2C), 29.4 (2C), 29.1 (2C), 28.2 (2C), 26.6 (2C), 25.7 (2C), 23.0 (4C), 21.9 (2 CH₃ γ-pyridinium), 21.4 (2 CH₃ α-pyridinium), 14.4 (4 CH₃ from n-alkyl chains). Anal. (C₈₄H₁₅₆N₄⁺ 2PF₆⁻), C, H, N.

N,N'-Bis(3-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)propylenyl)butane-N,N'-

bispalmitylamine dihexafluorophosphate 49: T_c = 69.4 °C; Yield 65%; 7.43 (br. s, 2H, 2 H-5 pyridinium), 7.37 (br. s, 2H, 2 H-3 pyridinium), 4.46 (t, 4H, J = 7.8 Hz, 2 N⁺-CH₂), 3.01 (t, J = 7.8 Hz, 4H, 2 CαPy-CH₂), 2.81 (s, 6H, 2 CH₃ α-pyridinium), 2.56 (m, 4H, 2 PalmitylN-CH₂CH₂CH₂N⁺), 2.50 (s, 6H, 2 CH₃ γ-pyridinium), 2.46 (m, 4H, HN-CH₂CH₂CH₂CH₂NPalmityl), 2.40 (t, J = 7.7 Hz, 4H, N-CH₂ from Palmityl), 1.86 (m, 4H, N⁺-CH₂CH₂CH₂NPalmityl), 1.74 (m, 4H, 2 Cα-CH₂CH₂), 1.44 (m, 12H, 2 Cα-CH₂CH₂CH₂ + PalmitylN-CH₂CH₂CH₂CH₂NPalmityl), 1.26 (m, 96H, 48 CH₂ from n-alkyl chains), 0.88 (t, J = 6.7 Hz, 12H, 4 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ,

ppm: 157.9 (2 C-4 pyridinium), 157.8 (2 C-2 pyridinium), 154.7 (2 C-6 pyridinium), 129.1 (2 C-5 pyridinium), 127.5 (2 C-3 pyridinium), 54.9 (2 N⁺-CH₂CH₂CH₂NPalmityl), 54.5 (2 N⁺-CH₂CH₂CH₂NPalmityl), 51.1 (PamitylN-CH₂CH₂CH₂CH₂NPalmityl), 50.9 (2C N-CH₂ from Palmityl), 33.2 (2 CαPy-CH₂-), 32.3 (2C), 30.0 (24C), 29.9 (4C), 29.7 (6C), 29.6 (2C), 29.2 (4C), 28.3 (2C), 28.0 (4C), 27.6 (2 N⁺-CH₂CH₂CH₂NH), 25.5 (2C), 23.0 (4C), 21.9 (2 CH₃ γ-pyridinium), 21.3 (2 CH₃ α-pyridinium), 14.4 (2 CH₃ from n-alkyl chains). Anal. (C₈₄H₁₆₀N₄⁺ 2PF₆⁻), C, H, N.

Tris(2-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)ethyl)amine

tris(2-(4,6-dimethyl-2-tetradecylpyridinium-1-yl)ethyl)amine hexafluorophosphate 50: T_c = 121.2 °C; Yield 57%; 7.42 (s, 3H, 3 H-5 pyridinium), 7.38 (s, 3H, 3 H-3 pyridinium), 4.57 (t, *J* = 7.0 Hz, 4H, 2 N⁺-CH₂), 3.01 (m, 6H, 3 N-CH₂), 2.99 (t, *J* = 7.8 Hz, 6H, 3 CαPy-CH₂), 2.77 (s, 9H, 3 CH₃ α-pyridinium), 2.51 (s, 9H, 3 CH₃ γ-pyridinium), 1.76 (cv, *J* = 7.5 Hz, 6H, 3 Cα-CH₂CH₂), 1.43 (m, 6H, 3 Cα-CH₂CH₂CH₂), 1.26 (m, 66H, 33 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.7 Hz, 9H, 3 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 158.8 (3 C-4 pyridinium), 158.0 (3 C-2 pyridinium), 154.7 (3 C-6 pyridinium), 129.2 (3 C-5 pyridinium), 127.9 (3 C-3 pyridinium), 52.2 (3 N⁺-CH₂), 50.3 (3 N-CH₂), 33.7 (3 CαPy-CH₂-), 32.3 (3C), 30.1 (12C), 30.0 (3C), 29.9 (6C), 29.7 (3C), 29.6 (3C), 28.7 (3C), 23.0 (3 CH₃ γ-pyridinium), 22.0 (3C), 21.5 (3 CH₃ α-pyridinium), 14.4 (3 CH₃ from n-alkyl chains). Anal. (C₆₉H₁₂₃N₄⁺ 3PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-hydroxyethyl)pyridinium hexafluorophosphate 51:

mp = 55.6 °C; ¹H-NMR (CDCl₃), δ, ppm: 7.44 (s, 1H, H-5 pyridinium), 7.37 (s, 1H, H-3 pyridinium), 4.60 (t, *J* = 5.4 Hz, 2H, N⁺-CH₂), 4.03 (m, 2H, HO-CH₂), 3.09 (br.s, 1H, 2 HO-CH₂), 3.05 (t, *J* = 8.0 Hz, 2H, CαPy-CH₂), 2.81 (s, 3H, CH₃ α-pyridinium), 2.52 (s, 3H, CH₃ γ-pyridinium), 1.70 (cv, *J* = 8.0 Hz, 2H, Cα-CH₂CH₂), 1.43 (cv, *J* = 7.5 Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 22H, 11 CH₂ from n-alkyl chain), 0.87 (t, *J* = 6.6 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ, ppm: 158.5 (C-2 pyridinium), 157.9 (C-4 pyridinium), 155.1 (C-6 pyridinium), 128.6 (C-5 pyridinium), 127.1 (C-3 pyridinium), 60.2 (HO-CH₂), 53.0 (N⁺-CH₂), 33.5 (CαPy-CH₂-), 31.9, 29.6 (2C), 29.5,

29.4, 29.3, 29.2, 29.1, 28.5, 28.4, 22.6, 21.9 (CH₃ γ-pyridinium), 21.4 (CH₃ α-pyridinium), 14.06 (CH₃ from n-alkyl chain). Anal. (C₂₃H₄₂NO⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-dodecanoyloxyethyl)pyridinium

hexafluorophosphate 52a: T_c = 61.3 °C; Yield 87%; ¹H-NMR (CDCl₃), δ, ppm: 7.48 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.77 (t, *J* = 6.0 Hz, 2H, N⁺-CH₂), 4.47 (t, *J* = 6.0 Hz, 2H, COO-CH₂), 3.04 (t, *J* = 8.1 Hz, 2H, CαPy-CH₂), 2.85 (s, 3H, CH₃ α-pyridinium), 2.54 (s, 3H, CH₃ γ-pyridinium), 2.24 (t, *J* = 7.6 Hz, 2H, O-CO-CH₂), 1.77 (cv, *J* = 7.9 Hz, 2H, Cα-CH₂CH₂), 1.51 (cv, *J* = 7.6 Hz, O-CO-CH₂CH₂), 1.47 (cv, *J* = 7.8 Hz, 2H, Cα-CH₂CH₂CH₂), 1.36 (m, 2H, O-CO-CH₂CH₂CH₂), 1.25 (m, 34H, 17 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 172.9 (CO), 158.6 (C-4 pyridinium), 158.4 (C-2 pyridinium), 155.3 (C-6 pyridinium), 128.8 (C-5 pyridinium), 126.9 (C-3 pyridinium), 60.7 (COO-CH₂), 49.7 (N⁺-CH₂), 33.6 (O-CO-CH₂-), 33.3 (CαPy-CH₂-), 31.9, 31.8, 29.6 (4C), 29.5 (3C), 29.4 (2C), 29.3 (3C), 29.2 (2C), 29.0, 28.3, 24.5, 22.6 (2C), 21.7 (CH₃ γ-pyridinium), 21.5 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₅H₆₄NO₂⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-tetradecanoyloxyethyl)pyridinium

hexafluorophosphate 52b: T_c = 68.5 °C; Yield 90%; ¹H-NMR (CDCl₃), δ, ppm: 7.49 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.77 (t, *J* = 6.0 Hz, 2H, N⁺-CH₂), 4.46 (t, *J* = 5.9 Hz, 2H, COO-CH₂), 3.04 (t, *J* = 8.0 Hz, 2H, CαPy-CH₂), 2.85 (s, 3H, CH₃ α-pyridinium), 2.54 (s, 3H, CH₃ γ-pyridinium), 2.24 (t, *J* = 7.6 Hz, 2H, O-CO-CH₂), 1.76 (cv, *J* = 7.9 Hz, 2H, Cα-CH₂CH₂), 1.51 (cv, *J* = 7.6 Hz, O-CO-CH₂CH₂), 1.46 (cv, *J* = 7.8 Hz, 2H, Cα-CH₂CH₂CH₂), 1.36 (m, 2H, O-CO-CH₂CH₂CH₂), 1.25 (m, 38H, 19 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 172.9 (CO), 158.6 (C-4 pyridinium), 158.4 (C-2 pyridinium), 155.2 (C-6 pyridinium), 128.8 (C-5 pyridinium), 126.9 (C-3 pyridinium), 60.7 (COO-CH₂), 49.7 (N⁺-CH₂), 33.6 (O-CO-CH₂-), 33.2 (CαPy-CH₂-), 31.9 (2C), 29.6 (4C), 29.5 (3C), 29.4 (2C), 29.3 (3C), 29.2 (4C), 29.0, 28.3, 24.5, 22.6 (2C), 21.7 (CH₃ γ-pyridinium),

21.5 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₇H₆₈NO₂⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-hexadecanoyloxyethyl)pyridinium

hexafluorophosphate 52c: T_c = 77.8 °C; Yield 91%; ¹H-NMR (CDCl₃), δ, ppm: 7.48 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.77 (t, *J* = 5.6 Hz, 2H, N⁺-CH₂), 4.46 (t, *J* = 5.7 Hz, 2H, COO-CH₂), 3.04 (t, *J* = 7.8 Hz, 2H, CαPy-CH₂), 2.85 (s, 3H, CH₃ α-pyridinium), 2.54 (s, 3H, CH₃ γ-pyridinium), 2.24 (t, *J* = 7.3 Hz, 2H, O-CO-CH₂), 1.77 (cv, *J* = 7.3 Hz, 2H, Cα-CH₂CH₂), 1.51 (cv, *J* = 7.3 Hz, O-CO-CH₂CH₂), 1.47 (cv, *J* = 7.6 Hz, 2H, Cα-CH₂CH₂CH₂), 1.36 (m, 2H, O-CO-CH₂CH₂CH₂), 1.26 (m, 42H, 21 CH₂ from n-alkyl chains), 0.88 (t, *J* = 6.8 Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 173.0 (CO), 158.6 (C-4 pyridinium), 158.4 (C-2 pyridinium), 155.3 (C-6 pyridinium), 128.8 (C-5 pyridinium), 126.9 (C-3 pyridinium), 60.7 (COO-CH₂), 49.7 (N⁺-CH₂), 33.7 (O-CO-CH₂-), 33.3 (CαPy-CH₂-), 31.9 (2C), 29.7 (6C), 29.6 (3C), 29.4 (3C), 29.3 (3C), 29.2 (2C), 29.0 (2C), 28.3, 24.6, 22.6 (2C), 21.7 (CH₃ γ-pyridinium), 21.5 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₉H₇₂NO₂⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-aminoethyl)pyridinium hexafluorophosphate 53: mp = 61.4 °C; ¹H-NMR (CDCl₃), δ, ppm: 7.46 (s, 1H, H-5 pyridinium), 7.38 (s, 1H, H-3 pyridinium), 4.49 (t, *J* = 6.7 Hz, 2H, N⁺-CH₂), 3.15 (t, *J* = 6.7 Hz, 2H, H₂N-CH₂), 3.05 (t, *J* = 8.0 Hz, 2H, CαPy-CH₂), 2.85 (s, 3H, CH₃ α-pyridinium), 2.53 (s, 3H, CH₃ γ-pyridinium), 1.72 (cv, *J* = 7.8 Hz, 2H, Cα-CH₂CH₂), 1.44 (cv, *J* = 7.6 Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 22H, 11 CH₂ from n-alkyl chain), 0.87 (t, *J* = 6.7 Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ, ppm: 158.2 (C-2 pyridinium), 157.7 (C-4 pyridinium), 154.9 (C-6 pyridinium), 128.7 (C-5 pyridinium), 127.0 (C-3 pyridinium), 53.6 (N⁺-CH₂), 40.9 (H₂N-CH₂), 33.5 (CαPy-CH₂-), 31.9, 29.6 (6C), 29.5, 29.4, 29.3, 29.2 (2C), 28.7, 22.6, 21.7 (CH₃ γ-pyridinium), 21.5 (CH₃ α-pyridinium), 14.1 (CH₃ from n-alkyl chain). Anal. (C₂₃H₄₃N₂⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-dodecanoylamidoethyl)pyridinium chloride 54a: T_c = 41.9 °C; Yield 51%; ¹H-NMR (CDCl₃), δ, ppm: 7.43 (s, 1H, H-5 pyridinium), 7.36 (s,

1H, H-3 pyridinium), 7.03 (br.s., 1H, NH), 4.55 (t, $J = 7.1$ Hz, 2H, N⁺-CH₂), 3.61 (q, $J = 6.8$ Hz, 2H, CONH-CH₂), 3.17 (t, $J = 7.7$ Hz, 2H, CαPy-CH₂), 2.89 (s, 3H, CH₃ α-pyridinium), 2.53 (s, 3H, CH₃ γ-pyridinium), 2.16 (t, $J = 7.7$ Hz, 2H, NH-CO-CH₂), 1.71 (cv, $J = 7.7$ Hz, 2H, Cα-CH₂CH₂), 1.53 (cv, $J = 6.9$ Hz, NH-CO-CH₂CH₂), 1.46 (cv, $J = 7.5$ Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 36H, 18 CH₂ from n-alkyl chains), 0.87 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 175.3 (CO), 158.8 (C-2 pyridinium), 157.9 (C-4 pyridinium), 155.0 (C-6 pyridinium), 128.6 (C-5 pyridinium), 127.1 (C-3 pyridinium), 50.3 (N⁺-CH₂), 37.9 (CONH-CH₂), 35.9 (NH-CO-CH₂-), 33.1 (CαPy-CH₂-), 31.9, 31.8, 29.6 (2C), 29.4 (2C), 29.3 (4C), 29.2 (2C), 29.1, 29.0, 25.4, 25.0, 22.6 (2C), 21.6 (CH₃ γ-pyridinium), 21.3 (CH₃ α-pyridinium), 14.0 (2 CH₃ from n-alkyl chains). Anal. (C₃₅H₆₅N₂O⁺ Cl⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-tetradecanoylamidoethyl)pyridinium chloride 54b:

T_c = 49.9 °C; Yield 55%; ¹H-NMR (CDCl₃), δ, ppm: 7.44 (s, 1H, H-5 pyridinium), 7.37 (s, 1H, H-3 pyridinium), 6.80 (t, $J = 6.2$ Hz, 1H, NH), 4.54 (t, $J = 7.1$ Hz, 2H, N⁺-CH₂), 3.61 (q, $J = 6.8$ Hz, 2H, CONH-CH₂), 3.17 (t, $J = 7.6$ Hz, 2H, CαPy-CH₂), 2.89 (s, 3H, CH₃ α-pyridinium), 2.54 (s, 3H, CH₃ γ-pyridinium), 2.16 (t, $J = 7.7$ Hz, 2H, NH-CO-CH₂), 1.72 (cv, $J = 7.6$ Hz, 2H, Cα-CH₂CH₂), 1.54 (cv, $J = 6.8$ Hz, NH-CO-CH₂CH₂), 1.47 (cv, $J = 7.5$ Hz, 2H, Cα-CH₂CH₂CH₂), 1.25 (m, 40H, 20 CH₂ from n-alkyl chains), 0.87 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ, ppm: 175.0 (CO), 158.8 (C-2 pyridinium), 158.0 (C-4 pyridinium), 154.9 (C-6 pyridinium), 128.6 (C-5 pyridinium), 127.1 (C-3 pyridinium), 50.3 (N⁺-CH₂), 37.9 (CONH-CH₂), 35.9 (NH-CO-CH₂-), 33.1 (CαPy-CH₂-), 31.9 (2C), 29.7 (4C), 29.5 (2C), 29.3 (4C), 29.1 (2C), 29.0, 25.4, 22.6 (2C), 21.6 (CH₃ γ-pyridinium), 21.3 (CH₃ α-pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₇H₆₉N₂O⁺ Cl⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-hexadecanoylamidoethyl)pyridinium chloride 54c:

T_c = 46.8 °C; Yield 48%; ¹H-NMR (CDCl₃), δ, ppm: 7.44 (s, 1H, H-5 pyridinium), 7.37 (s, 1H, H-3 pyridinium), 6.76 (t, $J = 6.2$ Hz, 1H, NH), 4.53 (t, $J = 7.1$ Hz, 2H, N⁺-CH₂), 3.60 (q, $J = 6.8$ Hz, 2H, CONH-CH₂), 3.17 (t, $J = 7.5$ Hz, 2H, CαPy-CH₂), 2.89 (s, 3H, CH₃ α-pyridinium), 2.54 (s, 3H, CH₃ γ-pyridinium), 2.16 (t, $J = 7.6$ Hz, 2H, NH-CO-CH₂), 1.72

(cv, $J = 7.6$ Hz, 2H, C α -CH₂CH₂), 1.54 (cv, $J = 6.8$ Hz, NH-CO-CH₂CH₂), 1.47 (cv, $J = 7.5$ Hz, 2H, C α -CH₂CH₂CH₂), 1.25 (m, 44H, 22 CH₂ from n-alkyl chains), 0.87 (t, $J = 6.6$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 175.1 (CO), 158.7 (C-2 pyridinium), 158.0 (C-4 pyridinium), 154.9 (C-6 pyridinium), 128.6 (C-5 pyridinium), 127.1 (C-3 pyridinium), 50.2 (N⁺-CH₂), 38.0 (CONH-CH₂), 35.9 (NH-CO-CH₂-), 33.0 (C α Py-CH₂-), 31.9 (2C), 29.7 (4C), 29.6 (4C), 29.5 (2C), 29.4 (2C), 29.3 (6C), 29.2, 29.1, 29.0, 25.4, 22.6 (2C), 21.6 (CH₃ γ -pyridinium), 21.3 (CH₃ α -pyridinium), 14.1 (2 CH₃ from n-alkyl chains). Anal. (C₃₉H₇₃N₂O⁺ Cl⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(2-mercaptoethyl)pyridinium hexafluorophosphate 55: mp = 71.9 °C; ¹H-NMR (CDCl₃), δ , ppm: 7.48 (s, 1H, H-5 pyridinium), 7.40 (s, 1H, H-3 pyridinium), 4.49 (t, $J = 7.1$ Hz, 2H, N⁺-CH₂), 2.99 (t, $J = 7.5$ Hz, 2H, C α Py-CH₂), 2.92 (q, $J = 6.6$ Hz, 2H, HS-CH₂) 2.81 (s, 3H, CH₃ α -pyridinium), 2.53 (s, 3H, CH₃ γ -pyridinium), 1.83 (t, $J = 8.2$ Hz, 1H, HS-CH₂), 1.74 (m, 2H, C α -CH₂CH₂), 1.45 (m, 2H, C α -CH₂CH₂CH₂), 1.25 (m, 22H, 11 CH₂ from n-alkyl chain), 0.87 (t, $J = 6.5$ Hz, 3H, CH₃ from n-alkyl chain); ¹³C-NMR (CDCl₃), δ , ppm: 158.5 (C-4 pyridinium), 157.7 (C-2 pyridinium), 154.4 (C-6 pyridinium), 129.0 (C-5 pyridinium), 127.3 (C-3 pyridinium), 53.3 (N⁺-CH₂), 33.4 (C α Py-CH₂-), 31.9, 29.6 (4C), 29.5, 29.4, 29.3, 29.2 (2C), 28.7, 22.6, 21.6 (CH₃ γ -pyridinium), 21.3 (CH₃ α -pyridinium), 14.1 (CH₃ from n-alkyl chain). Anal. (C₂₃H₄₂NS⁺ PF₆⁻), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(3,4-dithia-tetradecyl)pyridinium 56a: hexafluorophosphate T_c = 76.0 °C; Yield 58%; ¹H-NMR (CDCl₃), δ , ppm: 7.48 (s, 1H, H-5 pyridinium), 7.41 (s, 1H, H-3 pyridinium), 4.70 (t, $J = 8.0$ Hz, 2H, N⁺-CH₂), 3.04 (t, $J = 8.2$ Hz, 2H, C α Py-CH₂), 3.02 (t, $J = 8.0$ Hz, 2H, RSS-CH₂CH₂N⁺), 2.83 (s, 3H, CH₃ α -pyridinium), 2.76 (t, $J = 7.4$ Hz, 2H, RCH₂SS-CH₂CH₂N⁺), 2.53 (s, 3H, CH₃ γ -pyridinium), 1.77 (cv, $J = 7.8$ Hz, 2H, C α -CH₂CH₂), 1.68 (cv, $J = 7.4$ Hz, 2H, RCH₂CH₂SS-CH₂CH₂N⁺), 1.47 (cv, $J = 7.4$ Hz, 2H, C α -CH₂CH₂CH₂), 1.38 (m, 2H, RCH₂CH₂CH₂SS-CH₂CH₂N⁺), 1.26 (m, 32H, 16 CH₂ from n-alkyl chains), 0.88 (t, $J = 6.7$ Hz, 6H, 2 CH₃ from n-alkyl chains); ¹³C-NMR (CDCl₃), δ , ppm: 158.6 (C-4 pyridinium), 157.7 (C-2 pyridinium), 154.3 (C-6 pyridinium), 129.1 (C-5 pyridinium),

127.4 (C-3 pyridinium), 51.0 ($\text{N}^+-\underline{\text{CH}_2}$), 39.0 ($\text{N}^+\text{CH}_2\text{CH}_2\text{SS}-\underline{\text{CH}_2}$), 35.2 ($\text{N}^+\text{CH}_2\underline{\text{CH}_2}\text{SS}$), 33.3 ($\text{C}\alpha\text{Py}-\underline{\text{CH}_2}$ -), 31.9, 31.8, 29.6 (4C), 29.5 (3C), 29.4, 29.3 (3C), 29.2, 29.1 (2C), 28.8, 28.4, 22.6 (2C), 21.6 (CH_3 γ -pyridinium), 21.2 (CH_3 α -pyridinium), 14.1 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{33}\text{H}_{62}\text{NS}_2^+ \text{PF}_6^-$), C, H, N; **chloride** $T_c = 77.4$ °C; Yield 82% (from hexafluorophosphate); Anal. ($\text{C}_{33}\text{H}_{62}\text{NS}_2^+ \text{Cl}^-$), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(3,4-dithia-hexadecyl)pyridinium **56b:**

hexafluorophosphate $T_c = 81.0$ °C; Yield 63%; ^1H -NMR (CDCl_3), δ , ppm: 7.48 (s, 1H, H-5 pyridinium), 7.41 (s, 1H, H-3 pyridinium), 4.70 (t, $J = 8.0$ Hz, 2H, $\text{N}^+-\underline{\text{CH}_2}$), 3.03 (t, $J = 8.4$ Hz, 2H, $\text{C}\alpha\text{Py}-\underline{\text{CH}_2}$), 3.01 (t, $J = 8.0$ Hz, 2H, $\text{RSS}-\underline{\text{CH}_2}\text{CH}_2\text{N}^+$), 2.83 (s, 3H, CH_3 α -pyridinium), 2.76 (t, $J = 7.4$ Hz, 2H, $\text{RCH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 2.53 (s, 3H, CH_3 γ -pyridinium), 1.77 (cv, $J = 7.8$ Hz, 2H, $\text{C}\alpha-\text{CH}_2\underline{\text{CH}_2}$), 1.68 (cv, $J = 7.4$ Hz, 2H, $\text{RCH}_2\text{CH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 1.47 (cv, $J = 7.4$ Hz, 2H, $\text{C}\alpha-\text{CH}_2\text{CH}_2\underline{\text{CH}_2}$), 1.37 (m, 2H, $\text{RCH}_2\text{CH}_2\text{CH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 1.26 (m, 36H, 18 CH_2 from n-alkyl chains), 0.88 (t, $J = 6.7$ Hz, 6H, 2 CH_3 from n-alkyl chains); ^{13}C -NMR (CDCl_3), δ , ppm: 158.6 (C-4 pyridinium), 157.7 (C-2 pyridinium), 154.3 (C-6 pyridinium), 129.1 (C-5 pyridinium), 127.4 (C-3 pyridinium), 50.9 ($\text{N}^+-\underline{\text{CH}_2}$), 39.0 ($\text{N}^+\text{CH}_2\text{CH}_2\text{SS}-\underline{\text{CH}_2}$), 35.1 ($\text{N}^+\text{CH}_2\underline{\text{CH}_2}\text{SS}$), 33.3 ($\text{C}\alpha\text{Py}-\underline{\text{CH}_2}$ -), 31.9, 29.7 (2C), 29.6 (5C), 29.55 (2C), 29.4, 29.3 (4C), 29.2, 29.1 (2C), 28.8, 28.4, 22.6 (2C), 21.6 (CH_3 γ -pyridinium), 21.2 (CH_3 α -pyridinium), 14.1 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{35}\text{H}_{66}\text{NS}_2^+ \text{PF}_6^-$), C, H, N; **chloride** $T_c = 75.1$ °C; Yield 76% (from hexafluorophosphate); Anal. ($\text{C}_{35}\text{H}_{66}\text{NS}_2^+ \text{Cl}^-$), C, H, N.

4,6-Dimethyl-2-tetradecyl-1-(3,4-dithia-octadecyl)pyridinium **56c:**

hexafluorophosphate $T_c = 81.8$ °C; Yield 65%; ^1H -NMR (CDCl_3), δ , ppm: 7.48 (s, 1H, H-5 pyridinium), 7.41 (s, 1H, H-3 pyridinium), 4.70 (t, $J = 8.1$ Hz, 2H, $\text{N}^+-\underline{\text{CH}_2}$), 3.04 (t, $J = 8.4$ Hz, 2H, $\text{C}\alpha\text{Py}-\underline{\text{CH}_2}$), 3.02 (t, $J = 8.0$ Hz, 2H, $\text{RSS}-\underline{\text{CH}_2}\text{CH}_2\text{N}^+$), 2.83 (s, 3H, CH_3 α -pyridinium), 2.76 (t, $J = 7.4$ Hz, 2H, $\text{RCH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 2.54 (s, 3H, CH_3 γ -pyridinium), 1.77 (cv, $J = 7.8$ Hz, 2H, $\text{C}\alpha-\text{CH}_2\underline{\text{CH}_2}$), 1.68 (cv, $J = 7.4$ Hz, 2H, $\text{RCH}_2\text{CH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 1.48 (cv, $J = 7.6$ Hz, 2H, $\text{C}\alpha-\text{CH}_2\text{CH}_2\underline{\text{CH}_2}$), 1.37 (m, 2H, $\text{RCH}_2\text{CH}_2\text{CH}_2\text{SS}-\text{CH}_2\text{CH}_2\text{N}^+$), 1.26 (m, 40H, 20 CH_2 from n-alkyl chains), 0.88 (t, $J = 6.7$ Hz, 6H, 2 CH_3 from n-alkyl chains); ^{13}C -NMR (CDCl_3), δ , ppm: 158.6 (C-4

pyridinium), 157.7 (C-2 pyridinium), 154.3 (C-6 pyridinium), 129.1 (C-5 pyridinium), 127.4 (C-3 pyridinium), 50.9 ($\text{N}^+-\underline{\text{CH}_2}$), 39.0 ($\text{N}^+\text{CH}_2\text{CH}_2\text{SS}-\underline{\text{CH}_2}$), 35.1 ($\text{N}^+\text{CH}_2\underline{\text{CH}_2\text{SS}}$), 33.3 ($\text{C}\alpha\text{Py}-\underline{\text{CH}_2-}$), 31.9, 29.7 (5C), 29.6 (5C), 29.5, 29.4, 29.3 (4C), 29.2, 29.1 (2C), 28.8, 28.4, 22.6 (2C), 21.7 ($\text{CH}_3 \gamma$ -pyridinium), 21.2 ($\text{CH}_3 \alpha$ -pyridinium), 14.1 (2 CH_3 from n-alkyl chains). Anal. ($\text{C}_{37}\text{H}_{70}\text{NS}_2^+ \text{PF}_6^-$), C, H, N; **chloride** $T_c = 86.9^\circ\text{C}$; Yield 78% (from hexafluorophosphate); Anal. ($\text{C}_{37}\text{H}_{70}\text{NS}_2^+ \text{Cl}^-$), C, H, N.

1,6-Bis(4,6-dimethyl-2-tetradecylpyridinium-1-yl)-3,4-dithiahexane

dihexafluorophosphate 57: hexafluorophosphate $T_c = 107.0^\circ\text{C}$; Yield 71%; $^1\text{H-NMR}$ (CDCl_3), δ , ppm: 7.44 (s, 2H, 2 H-5 pyridinium), 7.36 (s, 2H, 2 H-3 pyridinium), 4.71 (t, $J = 7.5$ Hz, 4H, 2 $\text{N}^+-\underline{\text{CH}_2}$), 3.16 (t, $J = 7.6$ Hz, 4H, 2 $\text{N}^+-\text{CH}_2\underline{\text{CH}_2\text{S-S}}$), 3.01 (t, $J = 7.7$ Hz, 4H, 2 $\text{C}\alpha\text{Py}-\underline{\text{CH}_2}$) 2.82 (s, 6H, 2 $\text{CH}_3 \alpha$ -pyridinium), 2.50 (s, 6H, 2 $\text{CH}_3 \gamma$ -pyridinium), 1.75 (cv, $J = 7.1$ Hz, 4H, 2 $\text{C}\alpha-\text{CH}_2\underline{\text{CH}_2}$), 1.44 (cv, $J = 6.5$ Hz, 4H, 2 $\text{C}\alpha-\text{CH}_2\text{CH}_2\underline{\text{CH}_2}$), 1.27 (m, 40H, 20 CH_2 from n-alkyl chain), 0.87 (t, $J = 6.6$ Hz, 6H, 3 CH_3 from n-alkyl chain); $^{13}\text{C-NMR}$ (CDCl_3), δ , ppm: 158.5 (2 C-4 pyridinium), 157.7 (2 C-2 pyridinium), 154.5 (2 C-6 pyridinium), 128.9 (2 C-5 pyridinium), 127.3 (2 C-3 pyridinium), 50.7 (2 $\text{N}^+-\underline{\text{CH}_2}$), 34.8 (2 $\text{N}^+-\text{CH}_2\underline{\text{CH}_2\text{S}}$), 33.2 (2 $\text{C}\alpha\text{Py}-\underline{\text{CH}_2-}$), 31.9 (2C), 29.7 (6C), 29.6 (4C), 29.4 (2C), 29.3 (2C), 29.2 (4C), 28.5 (2C), 22.6 (2C), 21.6 (2 $\text{CH}_3 \gamma$ -pyridinium), 21.0 (2 $\text{CH}_3 \alpha$ -pyridinium), 14.1 (2 CH_3 from n-alkyl chain). Anal. ($\text{C}_{46}\text{H}_{82}\text{N}_2\text{S}_2^+ \text{PF}_6^-$), C, H, N; **chloride** $T_c = 139.3^\circ\text{C}$; Yield 79% (from hexafluorophosphate); Anal. ($\text{C}_{46}\text{H}_{82}\text{N}_2\text{S}_2^+ \text{Cl}^-$), C, H, N.

2. Elemental analysis data for the compounds described in the paper

No.	Formula	Elemental analysis data (calc./found)		
		%C	%H	%N
14a	$C_{17}H_{29}O^+ PF_6^-$	51.77/51.86	7.41/7.54	-
14b	$C_{18}H_{31}O^+ PF_6^-$	52.94/53.22	7.65/7.72	-
14c	$C_{19}H_{33}O^+ PF_6^-$	54.02/54.11	7.87/7.94	-
14d	$C_{20}H_{35}O^+ PF_6^-$	55.04/55.31	8.08/8.28	-
14e	$C_{21}H_{37}O^+ PF_6^-$	55.99/56.17	8.28/8.40	-
14f	$C_{22}H_{39}O^+ PF_6^-$	56.88/57.06	8.46/8.64	-
14g	$C_{23}H_{41}O^+ PF_6^-$	57.73/57.92	8.64/8.89	-
14h	$C_{24}H_{43}O^+ PF_6^-$	58.52/58.71	8.80/8.96	-
15	$C_{27}H_{50}N^+ PF_6^-$	60.77/60.94	9.44/9.14	2.62/2.63
16	$C_{29}H_{54}N^+ PF_6^-$	62.01/62.38	9.69/9.30	2.49/2.38
17	$C_{28}H_{52}N^+ PF_6^-$	61.40/61.53	9.57/9.37	2.56/2.55
18	$C_{30}H_{56}N^+ PF_6^-$	62.58/62.49	9.80/9.77	2.43/2.46
19	$C_{29}H_{54}N^+ PF_6^-$	62.01/61.95	9.69/9.38	2.49/2.55
20	$C_{31}H_{58}N^+ PF_6^-$	63.13/63.13	9.91/9.57	2.37/2.45
21	$C_{30}H_{56}N^+ PF_6^-$	62.58/62.76	9.80/9.57	2.43/2.33
22	$C_{32}H_{60}N^+ PF_6^-$	63.66/63.54	10.02/9.68	2.32/2.31
23	$C_{35}H_{66}N^+ PF_6^-$	65.09/65.29	10.30/9.97	2.17/2.18
24	$C_{36}H_{68}N^+ PF_6^-$	65.52/65.16	10.39/10.41	2.12/1.93
25	$C_{38}H_{72}N^+ PF_6^-$	66.34/66.19	10.55/10.42	2.04/2.18
26	$C_{39}H_{74}N^+ PF_6^-$	66.73/66.47	10.63/10.33	2.00/2.36
27	$C_{40}H_{76}N^+ PF_6^-$	67.10/66.75	10.70/10.38	1.96/1.97
28	$C_{42}H_{80}N^+ PF_6^-$	67.80/67.42	10.84/10.83	1.88/1.53
29	$C_{44}H_{78}N_2^+ 2PF_6^-$	57.13/57.41	8.50/8.13	3.03/3.26
30	$C_{45}H_{80}N_2^+ 2PF_6^-$	57.56/57.73	8.59/8.68	2.98/3.01
31	$C_{46}H_{82}N_2^+ 2PF_6^-$	57.97/58.22	8.67/8.88	2.94/2.75
32	$C_{47}H_{84}N_2^+ 2PF_6^-$	58.37/58.42	8.75/8.93	2.90/2.83
33	$C_{48}H_{86}N_2^+ 2PF_6^-$	58.76/58.72	8.83/8.61	2.86/2.45
34	$C_{49}H_{88}N_2^+ 2PF_6^-$	59.14/59.09	8.91/9.16	2.81/2.64
35	$C_{50}H_{90}N_2^+ 2PF_6^-$	59.51/59.78	8.99/9.22	2.78/2.77
40a	$C_{51}H_{91}N_3O_2^+ 2PF_6^-$	57.34/57.65	8.59/8.26	3.93/4.05
40b	$C_{53}H_{95}N_3O_2^+ 2PF_6^-$	58.07/58.40	8.73/8.93	3.83/4.11
40c	$C_{54}H_{97}N_3O_2^+ 2PF_6^-$	58.41/58.13	8.81/8.72	3.78/3.56
46	$C_{62}H_{112}N_4O_4^+ 2PF_6^-$	58.75/59.09	8.91/9.28	4.42/4.64

No.	Formula	Elemental analysis data (calc./found)		
		%C	%H	%N
41a	$C_{46}H_{83}N_3^+ 2PF_6^-$	57.07/57.25	8.64/8.86	4.34/4.21
41b	$C_{48}H_{87}N_3^+ 2PF_6^-$	57.87/57.49	8.80/8.62	4.22/4.34
41c	$C_{49}H_{89}N_3^+ 2PF_6^-$	58.26/58.31	8.88/8.97	4.16/4.12
47	$C_{52}H_{96}N_4^+ 2PF_6^-$	58.52/58.14	9.07/9.43	5.25/5.51
48a	$C_{80}H_{148}N_4^+ 2PF_6^-$	67.57/67.89	10.03/10.33	3.77/3.88
48b	$C_{84}H_{156}N_4^+ 2PF_6^-$	65.34/65.22	10.18/10.46	3.63/3.72
49	$C_{84}H_{160}N_4^+ 2PF_6^-$	66.54/66.98	10.64/10.99	3.70/3.84
50	$C_{69}H_{123}N_4^+ 3PF_6^-$	57.41/57.15	8.59/8.84	3.88/4.04
51	$C_{23}H_{42}NO^+ PF_6^-$	55.97/56.31	8.58/8.81	2.84/2.96
52a	$C_{35}H_{64}NO_2^+ PF_6^-$	62.20/62.34	9.54/9.32	2.07/2.12
52b	$C_{37}H_{68}NO_2^+ PF_6^-$	63.13/63.21	9.74/9.55	1.99/2.03
52c	$C_{39}H_{72}NO_2^+ PF_6^-$	64.00/64.08	9.91/10.07	1.91/1.90
53	$C_{23}H_{43}N_2^+ PF_6^-$	56.08/56.42	8.80/9.04	5.69/5.23
54a	$C_{35}H_{65}N_2O^+ Cl^-$	74.36/74.02	11.59/11.92	4.96/5.28
54b	$C_{37}H_{69}N_2O^+ Cl^-$	74.89/74.96	11.72/11.89	4.72/4.82
54c	$C_{39}H_{73}N_2O^+ Cl^-$	75.37/75.70	11.84/11.88	4.51/4.24
55	$C_{23}H_{42}NS^+ PF_6^-$	54.21/54.55	8.31/8.63	2.75/3.02
56a	$C_{33}H_{62}NS_2^+ PF_6^-$	58.12/58.37	9.16/9.42	2.05/1.87
	$C_{33}H_{62}NS_2^+ Cl^-$	69.24/69.56	10.92/11.05	2.45/2.09
56b	$C_{35}H_{66}NS_2^+ PF_6^-$	59.21/59.41	9.37/9.66	1.97/2.03
	$C_{35}H_{66}NS_2^+ Cl^-$	70.01/70.39	11.08/11.31	2.33/2.64
56c	$C_{37}H_{70}NS_2^+ PF_6^-$	60.21/60.49	9.56/9.86	1.90/1.86
	$C_{37}H_{70}NS_2^+ Cl^-$	70.70/71.02	11.23/11.48	2.23/2.38
57	$C_{46}H_{82}N_2S_2^+ PF_6^-$	54.31/54.21	8.13/8.29	2.75/2.88
	$C_{46}H_{82}N_2S_2^+ Cl^-$	69.22/69.43	10.35/10.63	3.51/3.23