

Supplementary info

Synthesis of tetraoctylammonium linoleate (N8888 C18:2)

Sodium hydroxide (0.71g, 17.8mmol) was added to linoleic acid (5.55ml, 17.8mmol) dissolved in ethanol 70% (50mL). The reaction mixture was stirred overnight at room temperature. Sodium linoleate (5.4g) was obtained as a white soap after removal of the solvent under vacuum. Afterwards, tetraoctylammonium chloride (8.94g, 17.8mmol), dissolved in toluene (50mL) and water (50mL), was added to the sodium linoleate. The reaction mixture was stirred for 3h at room temperature. The water phase was separated and the organic phase was washed with water (3 x 50mL). A viscous red product was obtained after removal of the solvent with a yield of 99% (13.1g). Purity >99%.

Characterization

$^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 0.87 (m, 15H), 1.29 (m, 60H), 1.64 (m, 10H), 2.03 (quin, $J=7\times(4); 4\text{H}$), 2.17 (m, 2H), 2.76 (t, $J=6.4\times(2); 2\text{H}$), 3.36 (m, 8H), 5.34 (m, 4H)

LCMS m/z : 466; 279 found (calcd for $\text{C}_{32}\text{H}_{68}\text{N}$, M^+ requires 466.535 and calcd for $\text{C}_{18}\text{H}_{31}\text{O}_2$, M^- requires 279.232).

Synthesis of methyltrioctylammonium linoleate (N8881 C18:2)

Synthesis of sodium linoleate was repeated according to the procedure for synthesising tetraoctylammonium linoleate. Sodium linoleate (5.4g, 17.8mmol) and water (50mL) were added to methyltrioctylammonium chloride (7.2g, 17.8mmol) dissolved in toluene (50mL). The reaction mixture was stirred for 3h at room temperature. The water phase was separated and the organic phase was washed with water (3 x 50mL). A yellow viscous liquid was obtained after removal of the solvent under vacuum with a yield of 99% (11.4g). Purity >99%.

Characterization

$^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 0.87 (m, 12H), 1.3 (m, 51H), 1.61 (m, 8H), 2.02 (quin, $j=6.8 \times (4)$; 4H), 2.17 (m, 2H), 2.75 (t, $j=6.4 \times (2)$; 2H), 3.31 (s, 3H), 3.41 (m, 6H), 5.33 (m, 4H)
LCMS m/z : 368; 279 found (calcd for $\text{C}_{25}\text{H}_{54}\text{N}$, M^+ requires 368.426 and calcd for $\text{C}_{18}\text{H}_{31}\text{O}_2$, M^- requires 279.232).

Synthesis of Tetraoctylammonium oleate (N8888 C18:1)

First, sodium oleate was made by adding sodium hydroxide (0.71g, 17.6mmol) to oleic acid (5.56mL, 17.6mmol) dissolved in ethanol 70% (50mL). The reaction mixture was stirred overnight at room temperature. Removal of the solvent under vacuum yielded the product as a white soap. This sodium oleate (5.4g, 17.6mmol) was added to tetraoctylammonium chloride (8.84g, 17.6mmol), dissolved in toluene (50mL) together with water (50mL). The reaction mixture was stirred for 3h at room temperature. The water phase was separated and the organic phase was washed with water (3 x 50mL). An orange viscous liquid was obtained after removal of the solvent under vacuum with a yield of 72% (10.44g). Purity >99%.

Characterization

$^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 0.86 (m, 15H), 1.28 (m, 60H), 1.65 (m, 10H), 1.99 (m, 4H), 2.18 (m, 2H), 3.41 (m, 10H), 5.32 (m, 2H)
LCMS m/z : 466; 281 found (calcd for $\text{C}_{32}\text{H}_{68}\text{N}$, M^+ requires 466.535 and calcd for $\text{C}_{18}\text{H}_{33}\text{O}_2$, M^- requires 281.248).

Synthesis of methyltrioctylammonium oleate (N8881 C18:1)

Sodium oleate was synthesized according to the procedure for synthesizing tetraoctylammonium oleate. Sodium oleate (5.4g, 17.6mmol) and water (50mL) were added to methyltrioctylammonium chloride (7.11g, 17.6mmol) dissolved in toluene (50mL). The reaction mixture was stirred for 3h at room temperature. The water phase was separated and

the organic phase was washed with water (3 x 50mL). A yellow viscous liquid was obtained after removal of the solvent under vacuum with a yield of 98% (12.35g). Purity >99%.

Characterization

$^1\text{H NMR}$ (400 MHz, CDCl_3): δ = 0.86 (m, 12H), 1.25 (m, 51H), 1.62 (m, 8H), 1.99 (m, 4H), 2.2 (m, 2H), 3.31 (s, 3H), 3.41 (m, 7H), 5.32 (m, 2H)

LCMS m/z : 368; 281 found (calcd for $\text{C}_{25}\text{H}_{54}\text{N}$, M^+ requires 368.426 and calcd for $\text{C}_{18}\text{H}_{33}\text{O}_2$, M^- requires 281.248).