

Supporting Information

Lysine-based amino-functionalized lipids for gene transfection: the influence of chain composition on 2D properties

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Table of Contents:

1. Additional Data
 - 1.1 Isotherms of **TH10**, **OH10** and **OO10** on bromide ion based buffers (pH 3 and pH 10)
 - 1.2 IRRAS phase state: methylene stretching vibrations of **TH10** and **OO10**
 - 1.3 Isotherms of **TH10** and **OO10** on bromide ion based buffers (pH 3, pH 7 and pH 10)
 - 1.4 Titration curves of **TH10** and **OO10**
 - 1.4.1 pH dependence of the protonation degree (TRXF)
 - 1.4.2 pH dependence of the phase state (IRRAS)
 - 1.5 Adsorption isotherms of ct-DNA to **TH10** and **OO10** monolayer at pH 3, pH 7 and pH 10
 - 1.6 Phosphate diester bands of calf thymus DNA attached to **TH10** and **OO10**
 - 1.7 IRRAS phase state: methylene stretching vibrations of **TH10** and **OO10** in absence and presence of calf thymus DNA

1. Additional Data

1.1 Isotherms of TH10, OH10 and OO10 on bromide ion based buffers (pH 3 and pH 10)

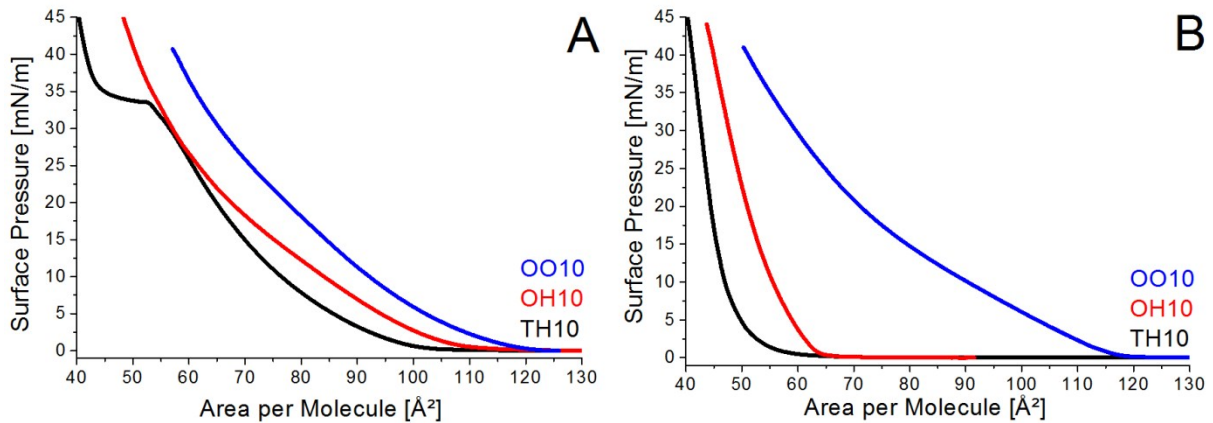


Figure S1: A) Langmuir monolayers of TH10 (black), OH10 (red) and OO10 (blue) at 20 °C on the pH 3 buffer, **B)** Langmuir monolayers of TH10 (black), OH10 (red) and OO10 (blue) at 20 °C on the pH 10 buffer.

1.2 IRRAS phase state: methylene stretching vibrations of TH10 and OO10

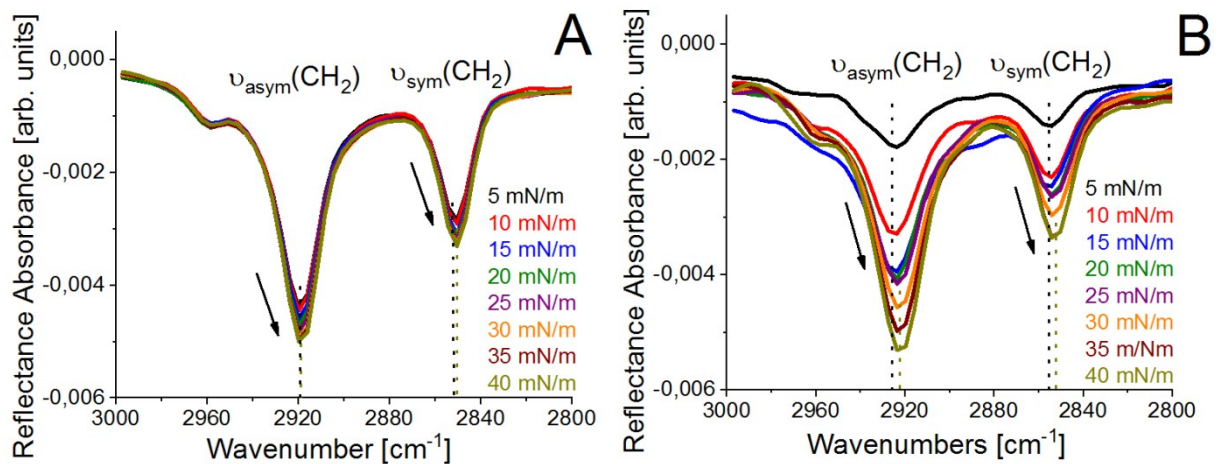


Figure S2: Antisymmetric and symmetric CH₂ stretching vibrations of TH10 (A) and OO10 (B) on water (pH 5.8) at 20 °C and at different surface pressures (indicated). Dashed lines are for guiding the eyes only.

1.3 Isotherms of TH10 and OO10 on bromide ion based buffers (pH 3, pH 7 and pH 10)

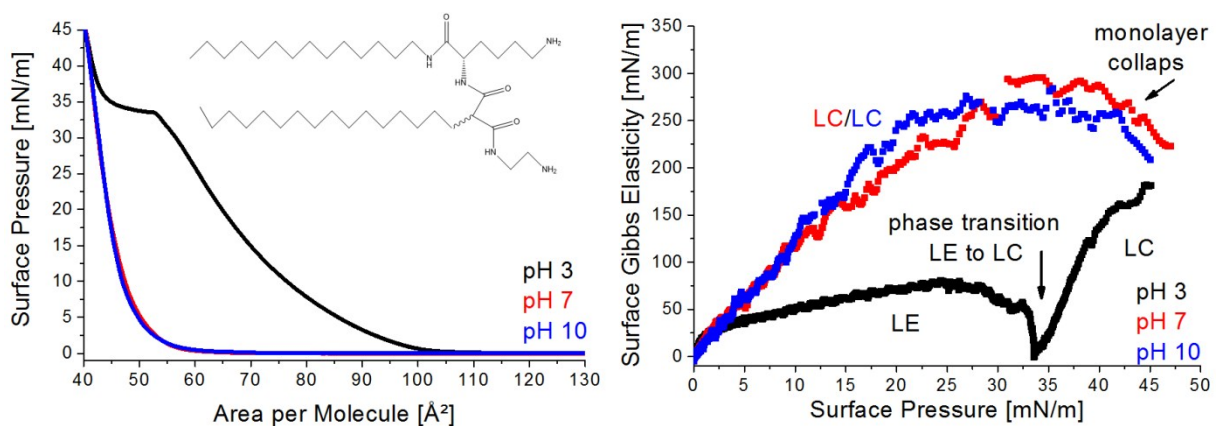


Figure S3: π -A isotherms and surface Gibbs elasticity of TH10 at 20 °C on bromide ion ($c = 2$ mM) based buffers.

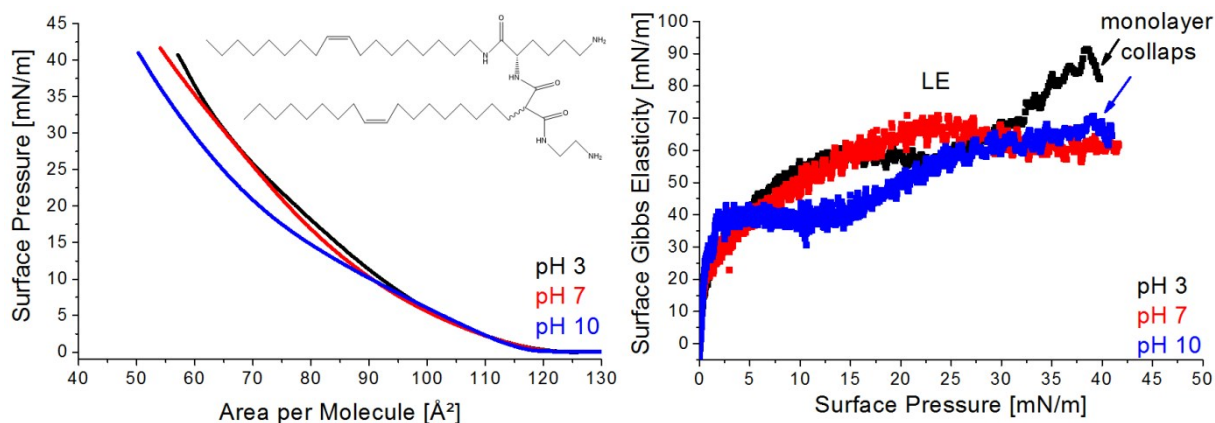


Figure S4: π -A isotherms and surface Gibbs elasticity of **OO10** at 20°C on bromide ion ($c = 2$ mM) based buffers.

1.4 Titration curves of **TH10** and **OO10**

1.4.1 Total Reflection X-Ray Fluorescence (pH dependence of the protonation state)

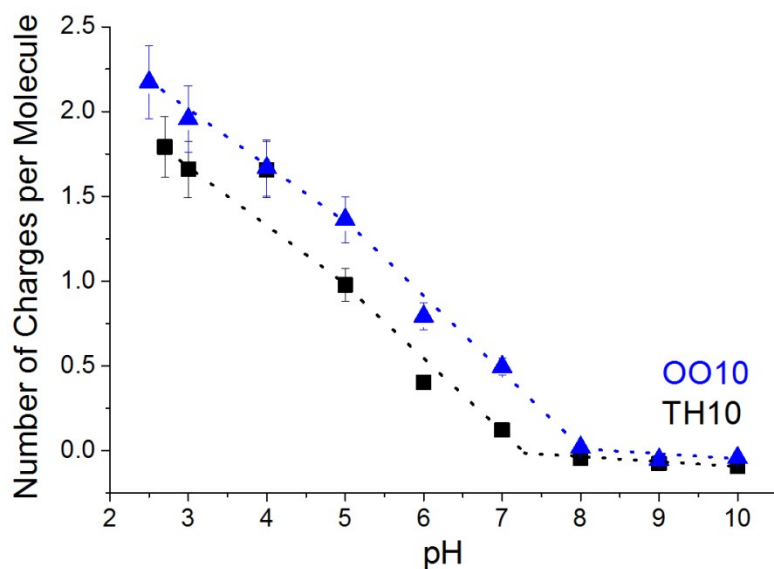


Figure S5: Titration curve of **TH10** (black) and **OO10** (blue) at $30 \text{ mN}\cdot\text{m}^{-1}$ on bromide ion ($c = 2$ mM) based buffers at 20 °C. Dotted lines are for guiding the eyes only.

1.4.2 Infrared Reflection Absorption Spectroscopy (pH dependence of the phase state)

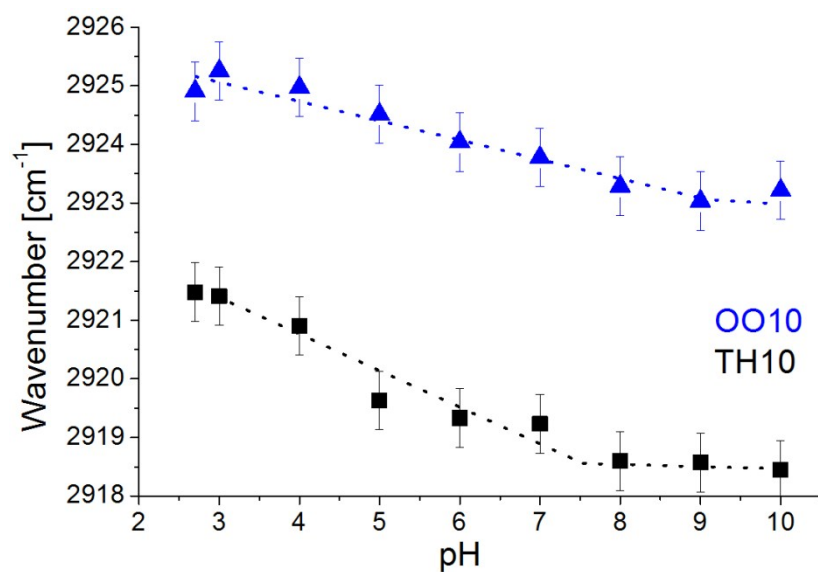


Figure S6: Phase state of **TH10** (black squares) and **OO10** (blue triangles) in dependence of the pH value at 20 °C on bromide ion ($c = 2 \text{ mM}$) based buffers at $30 \text{ mN}\cdot\text{m}^{-1}$. Dotted lines are for guiding the eyes only.

1.5 Adsorption isotherms of ct-DNA to **TH10** and **OO10** monolayer at pH 3, pH 7 and pH 10

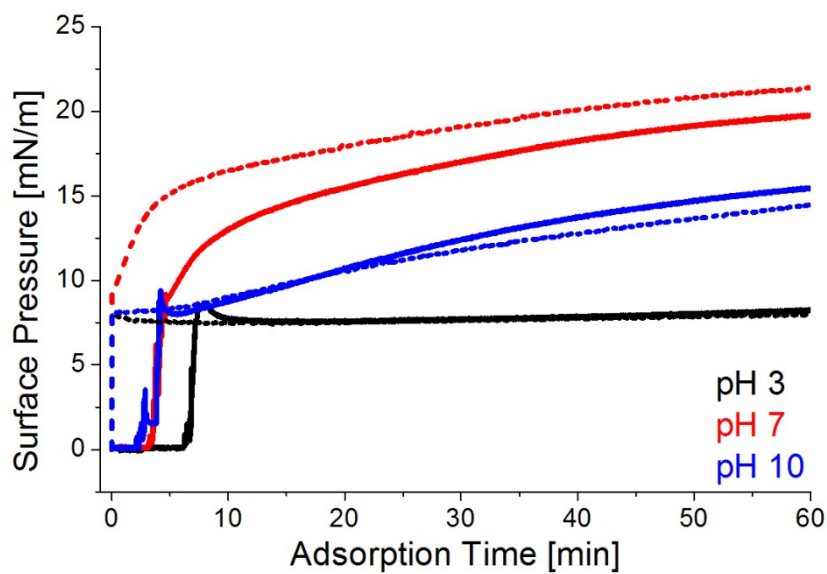


Figure S7: Adsorption of calf thymus DNA to **TH10** (straight lines) and **OO10** (dotted lines) monolayers in dependence of the pH value at 20 °C on bromide ion ($c = 2 \text{ mM}$) based buffers containing 0.1 mM calf thymus DNA.

1.6 Phosphate diester bands of calf thymus DNA attached to **TH10** and **OO10**

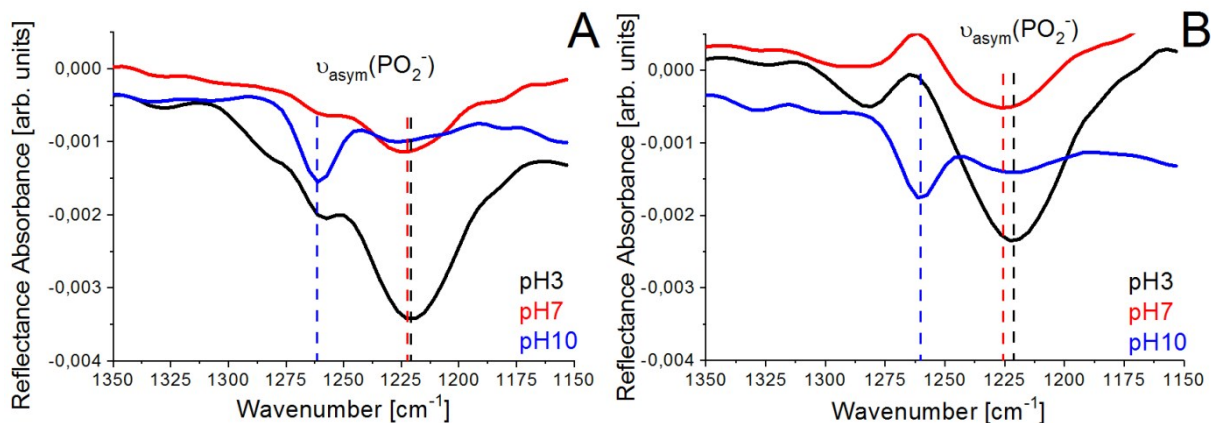


Figure S8: Asymmetric PO_2^- stretching vibrations of DNA attached to **TH10** (A) and **OO10** (B) monolayers at 20 °C on bromide ion ($c = 2 \text{ mM}$) based buffers at pH 3 (black), pH 7 (red) and pH 10 (blue), $\pi = 30 \text{ mN}\cdot\text{m}^{-1}$. Dashed lines are for guiding the eyes only.

1.7 IRRAS phase state: methylene stretching vibrations of **TH10** and **OO10** in absence and presence of calf thymus DNA

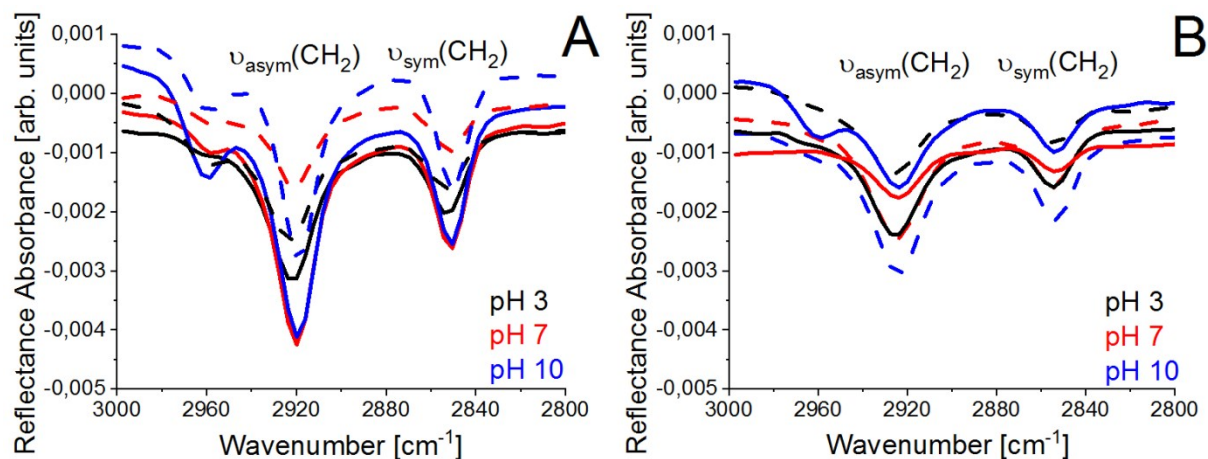


Figure S9: Asymmetric and symmetric CH_2 stretching vibrations of **TH10** (A) and **OO10** (B) monolayers in absence (straight lines) and presence (dashed lines) of calf thymus DNA at 20 °C on bromide ion ($c = 2 \text{ mM}$) based buffers at pH 3 (black), pH 7 (red) and pH 10 (blue), $\pi = 30 \text{ mN}\cdot\text{m}^{-1}$.