Electrokinetic mobility, pH and conductance/conductivity data for aqueous silica and PTFE suspension of controlled composition for selected temperature ranges

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ARTICLE INFO

Article history:
Received 29 June 2019
Received in revised form 22 July 2019
Accepted 26 July 2019
Available online 5 August 2019

Keywords:
Surface charge
Inert surface
Silica
Temperature dependence
Point of zero charge

ABSTRACT

The Data in Brief contains data on the electrokinetic mobility of PTFE and silica particles in aqueous suspensions as a function of pH and temperature. Furthermore, the concomitant conductivities and pH values are reported both for systems in the absence and presence of PTFE particles as a function of temperature and are compatible with the associated research paper “The influence of temperature on the charging of Polytetrafluoroethylene surfaces in electrolyte solutions” (Barisic et al.). The trend of the electrokinetic charging with temperature can be inferred from this for both kinds of particles. The data on the evolution of the pH and the measured conductivities are valuable input for future models that simulate the charge of inert surfaces at variable temperature.

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1. Data

The shared data involve the pH, electrophoretic mobility, the conductivity and the conductance of solutions and suspensions (containing particles of interest, i.e. PTFE or silica particles) as a function of temperature. In the experiments, we vary the initial pH of the solution and the salt composition. Tables 1–3, 6, 7, 11 and 12 present data on the electrophoretic mobilities and the conductance of the respective suspension for negative, uncharged, and positive surfaces. Tables 4, 5, 8–10, 13 and 14 include the corresponding conductivities and pH values. Table 8a and b show the reproducibility in terms of pH measurements. Table 10 a, b, c, and d show reproducibility in terms of conductivity measurements.

Fig. 1a shows an example pertaining to Table 2 for a negatively charged surface, while Fig. 1b shows the same kind of data for the positively charged surface (Table 11). The tables include the relevant experimental error estimates.

The trends in electrophoretic mobility are inversed based on the average values.

2. Experimental design, materials, and methods

The electrokinetic mobilities were measured using the Brookhaven Zeta-PALS equipment. This setup also measures conductance. The settings in most cases were such that the temperature was varied from room temperature down to low temperatures. In some cases, it was also chosen to start an experiment directly at a lower temperature to observe whether the starting point would affect the results. These experiments were done both with PTFE particles and AEROSIL380 particles.

Separate pH and conductivity measurements were obtained using the SurPass equipment. The pH and conductivity were measured starting at low temperature and letting the temperature slowly increase to room temperature. This was done for defined solutions in terms of salt and acid composition.
both with and without PTFE particles of known mass. In some experiments, a known mass PTFE particles were added to a solution with known volume (at room temperature) that had reached a given temperature.

PTFE particles were Microdispers-200 obtained from Polysciences Europe (Hirschberg, Germany). AEROSIL380 particles were obtained from EVONIK (Germany). All chemicals were reagent grade. Solutions were made using MilliQ water.

The pH and conductivity electrode of the SurPass equipment were calibrated as described in the manual of the set-up. The data were collected in the premeasurement option “record”.

The data are all presented as the raw data in terms of tables.

### Table 1
Electrophoretic mobility (and standard deviation) and conductance of a PTFE suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the PTFE suspension was 4.

| T (K)  | \( \mu \) (\( \mu \)m/s/(V/cm)) | \( \sigma_\mu \) (\( \mu \)m/s/(V/cm)) | G (\( \mu \)S) |
|-------|---------------------------------|-------------------------------------|----------------|
| 296.15| -2.31                           | 0.189                               | 2831           |
| 294.15| -2.21                           | 0.121                               | 2696           |
| 291.15| -2.07                           | 0.083                               | 2519           |
| 290.15| -2.02                           | 0.094                               | 2468           |
| 287.15| -1.90                           | 0.054                               | 2296           |
| 285.15| -1.83                           | 0.079                               | 2181           |
| 282.15| -1.67                           | 0.063                               | 2021           |
| 279.15| -1.59                           | 0.056                               | 1853           |
| 276.15| -1.48                           | 0.072                               | 1694           |

### Table 2
Electrophoretic mobility (and standard deviation) and conductance of a PTFE suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the PTFE suspension was 5.

| T (K)  | \( \mu \) (\( \mu \)m/s/(V/cm)) | \( \sigma_\mu \) (\( \mu \)m/s/(V/cm)) | G (\( \mu \)S) |
|-------|---------------------------------|-------------------------------------|----------------|
| 293.15| -1.57                           | 0.27                               | 2124           |
| 291.15| -1.57                           | 0.25                               | 2061           |
| 289.15| -1.48                           | 0.27                               | 1964           |
| 287.15| -1.56                           | 0.16                               | 1870           |
| 284.15| -1.50                           | 0.14                               | 1730           |
| 281.15| -1.31                           | 0.24                               | 1593           |
| 278.15| -1.16                           | 0.06                               | 1475           |
| 276.15| -1.02                           | 0.13                               | 1387           |

### Table 3
Electrophoretic mobility (and standard deviation) and conductance of an Aerosil380 suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the Aerosil380 suspension was 4.8.

| T (K)  | \( \mu \) (\( \mu \)m/s/(V/cm)) | \( \sigma_\mu \) (\( \mu \)m/s/(V/cm)) | G (\( \mu \)S) |
|-------|---------------------------------|-------------------------------------|----------------|
| 295.15| -1.02                           | 0.42                               | 3904           |
| 293.15| -1.16                           | 0.28                               | 3720           |
| 291.15| -1.43                           | 0.23                               | 3550           |
| 289.15| -1.64                           | 0.15                               | 3400           |
| 286.15| -1.74                           | 0.11                               | 3160           |
| 284.15| -1.78                           | 0.08                               | 3015           |
| 282.15| -1.82                           | 0.06                               | 2854           |
| 280.15| -1.75                           | 0.08                               | 2706           |
| 278.15| -1.77                           | 0.06                               | 2569           |
| 276.15| -1.72                           | 0.05                               | 2408           |
Table 4
pH of a solution (a) and pH of a PTFE suspension (b) containing 0.1 mM KNO₃ as a function of temperature. At room temperature the pH of the PTFE suspension was 4.8. The mass concentration in the PTFE suspension was 0.35 g/L.

| T (K) | pH    |
|------|-------|
| (a)  |       |
| 282.08 | 4.655 |
| 282.68 | 4.663 |
| 283.11 | 4.670 |
| 283.68 | 4.677 |
| 284.06 | 4.686 |
| 284.58 | 4.691 |
| 285.17 | 4.700 |
| 285.72 | 4.710 |
| 286.24 | 4.715 |
| 286.64 | 4.724 |
| 287.11 | 4.729 |
| 287.64 | 4.728 |
| 288.13 | 4.737 |
| 288.65 | 4.730 |
| 289.25 | 4.739 |
| 289.73 | 4.753 |
| 290.24 | 4.750 |
| 290.74 | 4.751 |
| 291.24 | 4.751 |
| (b)  |       |
| 282.11 | 4.638 |
| 282.69 | 4.643 |
| 283.10 | 4.645 |
| 283.63 | 4.651 |
| 284.13 | 4.660 |
| 284.72 | 4.662 |
| 285.17 | 4.668 |
| 285.70 | 4.669 |
| 286.20 | 4.676 |
| 286.67 | 4.674 |
| 287.02 | 4.666 |
| 287.44 | 4.674 |
| 287.92 | 4.677 |
| 288.29 | 4.676 |
| 288.70 | 4.678 |
| 289.03 | 4.677 |
| 289.41 | 4.682 |
| 289.75 | 4.675 |
| 290.08 | 4.683 |
| 290.38 | 4.688 |
| 290.72 | 4.685 |
| 291.01 | 4.681 |
| 291.32 | 4.689 |
Table 5
Conductivity of a solution (a) and conductivity of a PTFE suspension (b) containing 0.1 mM KNO₃ as a function of temperature. At room temperature the pH of the PTFE suspension was 4.8. The mass concentration in the PTFE suspension was 0.35 g/L.

| T (K) | κ (mS/m) |
|-------|----------|
| (a)   |          |
| 282.08| 1.556    |
| 282.68| 1.574    |
| 283.11| 1.585    |
| 283.68| 1.605    |
| 284.06| 1.642    |
| 284.58| 1.662    |
| 285.17| 1.683    |
| 285.72| 1.698    |
| 286.24| 1.719    |
| 286.64| 1.732    |
| 287.11| 1.755    |
| 287.64| 1.772    |
| 288.13| 1.789    |
| 288.65| 1.806    |
| 289.25| 1.825    |
| 289.73| 1.844    |
| 290.24| 1.861    |
| 290.74| 1.876    |
| 291.24| 1.891    |
| (b)   |          |
| 282.11| 1.560    |
| 282.69| 1.590    |
| 283.10| 1.613    |
| 283.63| 1.641    |
| 284.13| 1.667    |
| 284.72| 1.696    |
| 285.17| 1.718    |
| 285.70| 1.744    |
| 286.20| 1.769    |
| 286.67| 1.790    |
| 287.02| 1.807    |
| 287.44| 1.826    |
| 287.92| 1.848    |
| 288.29| 1.865    |
| 288.70| 1.884    |
| 289.03| 1.900    |
| 289.41| 1.917    |
| 289.75| 1.933    |
| 290.08| 1.949    |
| 290.38| 1.962    |
| 290.72| 1.978    |
| 291.01| 1.991    |
| 291.32| 2.005    |
Table 6
Electrophoretic mobility and conductance of a PTFE suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the PTFE suspension was 2.5.

| T (K) | μ (μm/s/[V/cm]) | σp (μm/s/[V/cm]) | G (μS) |
|-------|-----------------|-----------------|--------|
| 296.15| –0.02           | 0.09            | 6009   |
| 293.15| –0.01           | 0.09            | 5436   |
| 289.15| –0.02           | 0.15            | 5045   |
| 286.15| 0.03            | 0.11            | 4818   |
| 283.15| –0.03           | 0.14            | 4614   |
| 281.15| 0.00            | 0.09            | 4512   |
| 279.15| –0.03           | 0.14            | 4432   |

Table 7
Electrophoretic mobility and conductance of an Aerosil380 suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the AEROSIL380 suspension was 3.

| T (K) | μ (μm/s/[V/cm]) | σp (μm/s/[V/cm]) | G (μS) |
|-------|-----------------|-----------------|--------|
| 297.15| 0.06            | 0.09            | 3258   |
| 294.15| 0.04            | 0.06            | 2837   |
| 291.15| 0.03            | 0.12            | 2574   |
| 289.15| 0.03            | 0.06            | 2447   |
| 286.15| 0.04            | 0.14            | 2109   |
| 283.15| 0.03            | 0.06            | 1877   |
| 281.15| 0.02            | 0.08            | 1734   |
| 279.15| 0.04            | 0.06            | 1595   |
| 276.15| 0.05            | 0.11            | 1422   |

Table 8
pH of two solutions (a, b) and pH of a PTFE suspension (c) containing 0.1 mM KNO₃ as a function of temperature. At room temperature the pH of the PTFE suspension was 3.05. The mass concentration in the PTFE suspension was 0.83 g/L.

| T (K) | pH   |
|-------|------|
| (a)   |      |
| 278.60| 2.964|
| 278.97| 2.965|
| 279.68| 2.966|
| 280.35| 2.970|
| 280.97| 2.973|
| 281.55| 2.976|
| 282.09| 2.978|
| 282.61| 2.981|
| 283.35| 2.986|
| 283.84| 2.989|
| 284.32| 2.991|
| 284.76| 2.994|
| 285.20| 2.996|
| 285.62| 2.999|
| 286.20| 3.002|
| 286.58| 3.004|
| 287.11| 3.008|
| 287.61| 3.010|
| 288.09| 3.012|
| 288.68| 3.016|
| 289.23| 3.019|
| 289.72| 3.022|
| 290.19| 3.025|
| 290.73| 3.029|
| 291.13| 3.033|
| 291.58| 3.037|
| T (K)  | pH     |
|--------|--------|
| 292.00 | 3.040  |
| 292.31 | 3.043  |
| 292.60 | 3.046  |
| (b)    |        |
| 278.10 | 2.957  |
| 278.91 | 2.963  |
| 279.69 | 2.969  |
| 280.41 | 2.974  |
| 281.07 | 2.978  |
| 281.69 | 2.980  |
| 282.28 | 2.985  |
| 282.83 | 2.988  |
| 283.35 | 2.991  |
| 283.82 | 2.995  |
| 284.28 | 2.997  |
| 284.91 | 3.000  |
| 285.51 | 3.002  |
| 286.12 | 3.006  |
| 286.72 | 3.009  |
| 287.29 | 3.013  |
| 287.83 | 3.015  |
| 288.34 | 3.019  |
| 288.81 | 3.022  |
| 289.25 | 3.025  |
| 289.81 | 3.029  |
| 290.33 | 3.032  |
| 290.81 | 3.034  |
| 291.25 | 3.038  |
| 291.84 | 3.042  |
| 292.29 | 3.044  |
| 292.70 | 3.049  |
| (c)    |        |
| 278.94 | 3.019  |
| 279.31 | 3.020  |
| 279.70 | 3.024  |
| 280.06 | 3.025  |
| 280.77 | 3.027  |
| 281.42 | 3.030  |
| 282.36 | 3.034  |
| 283.19 | 3.036  |
| 283.97 | 3.040  |
| 284.92 | 3.045  |
| 285.76 | 3.050  |
| 286.51 | 3.054  |
| 287.01 | 3.055  |
| 287.46 | 3.059  |
| 288.01 | 3.061  |
| 288.51 | 3.063  |
| 288.96 | 3.064  |
| 289.43 | 3.066  |
| 289.93 | 3.070  |
| 290.43 | 3.073  |
| 291.04 | 3.077  |
| 291.57 | 3.082  |
| 292.06 | 3.087  |
Table 9
Conductivity of a solution (a) and conductivity of a PTFE suspension (b) containing 0.1 mM KNO₃ as a function of temperature. At room temperature the pH of the PTFE suspension was 3.05. The mass concentration in the PTFE suspension was 0.83 g/L.

| T (K) | k (mS/m) |
|-------|----------|
| (a)   |          |
| 278.60| 36.0     |
| 278.97| 36.4     |
| 279.68| 37.0     |
| 280.35| 37.5     |
| 280.97| 38.0     |
| 281.55| 38.5     |
| 282.09| 38.9     |
| 282.61| 39.2     |
| 283.35| 39.9     |
| 283.84| 40.4     |
| 284.32| 40.7     |
| 284.76| 41.1     |
| 285.20| 41.5     |
| 285.62| 41.8     |
| 286.20| 42.3     |
| 286.58| 42.6     |
| 287.11| 43.0     |
| 287.61| 43.4     |
| 288.09| 43.8     |
| 288.68| 44.3     |
| 289.23| 44.8     |
| 289.72| 45.2     |
| 290.19| 45.6     |
| 290.73| 46.0     |
| 291.13| 46.3     |
| 291.58| 46.7     |
| 292.00| 47.0     |
| 292.31| 47.2     |
| 292.60| 47.5     |
| (b)   |          |
| 278.94| 34.2     |
| 279.31| 34.5     |
| 279.70| 34.8     |
| 280.06| 35.1     |
| 280.77| 35.6     |
| 281.42| 36.1     |
| 282.36| 36.8     |
| 283.19| 37.4     |
| 283.97| 38.0     |
| 284.92| 38.7     |
| 285.76| 39.2     |
| 286.51| 39.9     |
| 287.01| 40.3     |
| 287.46| 40.7     |
| 288.01| 41.1     |
| 288.51| 41.4     |
| 288.96| 41.7     |
| 289.43| 42.1     |
| 289.93| 42.4     |
| 290.43| 42.7     |
| 291.04| 43.2     |
| 291.57| 43.5     |
| 292.06| 43.8     |
| 292.57| 44.2     |
| 293.02| 44.5     |
Table 10
Conductivity of four solutions (a, b, c, d) and conductivity of a
PTFE suspension (e) containing 0.1 mM KNO₃ as a function of
temperature. The room temperature pH of the PTFE suspension
was 3.05. The entries in italic in (d) correspond to the
suspension, resulting from addition of PTFE particles at about
6°C PTFE particles (resulting mass concentration 0.83 g/L).

| T (K) | T (K) | κ (mS/m) | κ (mS/m) |
|-------|-------|----------|----------|
| 274.30 | 274.30 | 32.4     | 32.4     |
| 274.57 | 274.57 | 32.6     | 32.6     |
| 274.82 | 274.82 | 32.8     | 32.8     |
| 275.11 | 275.11 | 33.0     | 33.0     |
| 275.39 | 275.39 | 33.2     | 33.2     |
| 275.67 | 275.67 | 33.5     | 33.5     |
| 276.22 | 276.22 | 33.9     | 33.9     |
| 276.72 | 276.72 | 34.3     | 34.3     |
| 277.20 | 277.20 | 34.7     | 34.7     |
| 277.69 | 277.69 | 35.1     | 35.1     |
| 278.14 | 278.14 | 35.4     | 35.4     |
| 278.57 | 278.57 | 35.8     | 35.8     |
| 278.98 | 278.98 | 36.0     | 36.0     |
| (b)    | (b)    | 280.99   | 38.0     |
| 281.93 | 281.93 | 38.7     | 38.7     |
| 282.74 | 282.74 | 39.2     | 39.2     |
| 283.45 | 283.45 | 39.9     | 39.9     |
| 284.08 | 284.08 | 40.5     | 40.5     |
| 284.64 | 284.64 | 40.9     | 40.9     |
| 285.16 | 285.16 | 41.4     | 41.4     |
| 285.64 | 285.64 | 41.8     | 41.8     |
| 286.09 | 286.09 | 42.1     | 42.1     |
| 286.88 | 286.88 | 42.8     | 42.8     |
| 287.57 | 287.57 | 43.1     | 43.1     |
| 288.19 | 288.19 | 43.8     | 43.8     |
| 288.74 | 288.74 | 44.1     | 44.1     |
| 289.26 | 289.26 | 44.4     | 44.4     |
| 289.93 | 289.93 | 44.9     | 44.9     |
| 290.52 | 290.52 | 45.4     | 45.4     |
| 291.05 | 291.05 | 45.6     | 45.6     |
| 291.64 | 291.64 | 46.3     | 46.3     |
| 292.17 | 292.17 | 46.8     | 46.8     |
| 292.74 | 292.74 | 47.2     | 47.2     |
| 293.23 | 293.23 | 47.6     | 47.6     |
| (c)    | (c)    | 278.47   | 35.6     |
| 278.88 | 278.88 | 36.0     | 36.0     |
| 279.30 | 279.30 | 36.3     | 36.3     |
| 279.88 | 279.88 | 36.8     | 36.8     |
| 280.43 | 280.43 | 37.2     | 37.2     |
| 280.95 | 280.95 | 37.6     | 37.6     |
| 281.47 | 281.47 | 38.1     | 38.1     |
| 281.97 | 281.97 | 38.4     | 38.4     |
| 282.45 | 282.45 | 38.8     | 38.8     |
| 282.90 | 282.90 | 39.1     | 39.1     |
| 283.49 | 283.49 | 39.7     | 39.7     |
| 283.91 | 283.91 | 40.0     | 40.0     |
| 284.43 | 284.43 | 40.4     | 40.4     |
| 284.93 | 284.93 | 40.8     | 40.8     |
| 285.41 | 285.41 | 41.2     | 41.2     |
| 285.85 | 285.85 | 41.5     | 41.5     |
| 286.38 | 286.38 | 41.9     | 41.9     |
| 286.88 | 286.88 | 42.3     | 42.3     |
| 287.43 | 287.43 | 42.7     | 42.7     |

(continued on next page)
Table 10 (continued)

| T (K) | $\kappa$ (mS/m) |
|-------|-----------------|
| 287.88| 43.1            |
| 288.39| 43.5            |
| 288.87| 43.9            |
| 289.31| 44.2            |
| 289.80| 44.6            |
| 290.19| 44.9            |
| 290.61| 45.2            |
| 291.00| 45.5            |
| 291.31| 45.7            |
| 291.64| 45.9            |
| 291.99| 46.2            |
| 292.35| 46.4            |
| 292.64| 46.6            |
| 292.90| 46.8            |
| 293.15| 46.9            |
| 275.49| 33.1            |
| 276.18| 33.8            |
| 276.83| 34.3            |
| 277.45| 34.8            |
| 278.03| 35.3            |
| 278.58| 35.7            |
| 279.11| 36.1            |
| 279.60| 36.5            |
| 280.08| 36.9            |
| 280.55| 37.3            |
| 281.14| 37.8            |
| 281.57| 38.1            |
| 282.12| 38.5            |
| 282.64| 38.9            |
| 283.14| 39.2            |
| 283.73| 39.8            |
| 284.29| 40.3            |
| 284.93| 40.8            |
| 285.43| 41.2            |
| 285.91| 41.5            |
| 286.44| 42.0            |
| 287.03| 42.4            |
| 287.50| 42.8            |
| 287.93| 43.1            |
| 288.35| 43.4            |
| 288.82| 43.7            |
| 289.30| 44.0            |
| 289.75| 44.3            |
| 290.16| 44.6            |
| 290.59| 44.9            |
| 290.95| 45.1            |
| 291.32| 45.4            |
| 291.66| 45.6            |
| 292.00| 45.8            |
| 292.42| 46.1            |
| 292.71| 46.3            |
| 275.94| 33.7            |
| 276.47| 34.1            |
| 276.98| 34.5            |
| 277.45| 34.9            |
| 277.91| 35.3            |
| 278.37| 35.6            |
| 278.77| 35.9            |
| 279.42| 33.1            |
| 280.13| 33.7            |
Table 10 (continued)

| T (K) | \( \kappa \) (mS/m) |
|-------|---------------------|
| 280.81 | 34.2 |
| 281.48 | 34.7 |
| 282.12 | 35.2 |
| 282.73 | 35.6 |
| 283.30 | 36.1 |
| 283.84 | 36.5 |
| 284.35 | 36.9 |
| 284.85 | 37.2 |
| 285.32 | 37.6 |
| 285.76 | 37.9 |
| 286.19 | 38.2 |
| 286.59 | 38.5 |
| 286.98 | 38.8 |
| 287.34 | 39.0 |
| 288.19 | 39.7 |
| 288.50 | 39.9 |
| 289.02 | 40.3 |
| 289.50 | 40.7 |
| 289.87 | 41.0 |
| 290.40 | 41.3 |
| 290.87 | 41.7 |
| 291.30 | 42.0 |
| 291.69 | 42.3 |
| 292.04 | 42.6 |
| 292.35 | 42.8 |
| 292.73 | 43.1 |
| 293.00 | 43.3 |
| 293.21 | 43.5 |

Table 11
Electrophoretic mobility (and standard deviation) and conductance of a PTFE suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the PTFE suspension was 1.8.

| T (K) | \( \mu \) (\( \mu \)m/s/(V/cm)) | \( \sigma_\mu \) (\( \mu \)m/s/(V/cm)) | G (\( \mu \)S) |
|-------|----------------|----------------|-------------|
| 296.15 | 0.21 | 0.10 | 19172 |
| 294.15 | 0.16 | 0.06 | 18324 |
| 291.15 | 0.14 | 0.24 | 17389 |
| 287.15 | 0.07 | 0.09 | 16115 |
| 285.15 | 0.03 | 0.05 | 15251 |
| 283.15 | 0.03 | 0.09 | 14674 |
| 280.15 | 0.06 | 0.12 | 13592 |
| 278.15 | 0.04 | 0.09 | 12860 |
| 276.15 | 0.02 | 0.07 | 12123 |

Table 12
Electrophoretic mobility (and standard deviation) and conductance of an Aerosil380 suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the Aerosil380 suspension was 2.7.

| T (K) | \( \mu \) (\( \mu \)m/s/(V/cm)) | \( \sigma_\mu \) (\( \mu \)m/s/(V/cm)) | G (\( \mu \)S) |
|-------|----------------|----------------|-------------|
| 297.15 | 0.38 | 0.08 | 3683 |
| 294.15 | 0.35 | 0.06 | 3387 |
| 292.15 | 0.32 | 0.07 | 3210 |
| 289.15 | 0.31 | 0.04 | 2939 |
| 287.15 | 0.29 | 0.04 | 2799 |
| 285.15 | 0.28 | 0.07 | 2653 |
| 283.15 | 0.27 | 0.06 | 2530 |
| 279.15 | 0.27 | 0.06 | 2270 |
| 276.15 | 0.25 | 0.04 | 2084 |
Table 13
pH and conductivity of a solution (a) and conductivity of a PTFE suspension (b) containing 0.1 mM KNO₃ as a function of temperature in lower temperature ranges. The experiment was started at 8 °C and measurements were stopped at about 15 °C. At room temperature the pH of the PTFE suspension was 1.65. The mass concentration in the PTFE suspension was 0.5 g/L.

| T (K) | pH  | κ (mS/m) |
|-------|-----|----------|
| (a)   |     |          |
| 281.36| 1.490| 677.9    |
| 282.88| 1.538| 695.3    |
| 284.29| 1.566| 713.5    |
| 285.26| 1.582| 726.5    |
| 286.07| 1.592| 737.0    |
| 286.80| 1.599| 745.9    |
| 287.48| 1.605| 753.9    |
| (b)   |     |          |
| 281.04| 1.543| 767.1    |
| 282.26| 1.566| 787.2    |
| 283.28| 1.580| 803.6    |
| 284.15| 1.590| 817.7    |
| 284.97| 1.598| 830.5    |
| 285.73| 1.605| 842.2    |
| 286.44| 1.617| 852.7    |

Table 14
pH and conductivity of a solution (a) and pH and conductivity of a PTFE suspension (b) containing 0.1 mM KNO₃ as a function of temperature in lower temperature ranges. The experiment was started at 17 °C and measurements were stopped at room temperature. At room temperature the pH of the PTFE suspension was 1.65. The mass concentration in the PTFE suspension was 0.5 g/L.

| T (K) | pH  | κ (mS/m) |
|-------|-----|----------|
| (a)   |     |          |
| 290.26| 1.599| 785.5    |
| 291.12| 1.608| 794.9    |
| 291.88| 1.614| 803.0    |
| 292.53| 1.619| 810.2    |
| 293.11| 1.623| 816.5    |
| 293.62| 1.627| 822.1    |
| 294.24| 1.632| 829.1    |
| (b)   |     |          |
| 290.34| 1.619| 907.9    |
| 291.15| 1.624| 919.2    |
| 291.86| 1.628| 928.4    |
| 292.48| 1.632| 936.8    |
| 293.04| 1.634| 944.7    |
| 293.52| 1.638| 951.4    |
| 294.17| 1.642| 961.8    |
Acknowledgements

Part of this work has been supported by Croatian Science Foundation under the project (IP-2014-09-6972).

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Fig. 1. a) Electrophoretic mobility and conductance of a PTFE suspension in 10 mM NaCl as a function of temperature. At room temperature the pH of the PTFE suspension was 5. b) Corresponding plot for a net positive surface, where the pH of the suspension at room temperature was 1.8.