

Claims

1. Method for determining at least one membrane property of an analyte sensor (112),
5 wherein the analyte sensor (112) comprises at least two measurement electrodes (114), wherein at least one of the measurement electrodes (114) comprises at least one membrane element (122) having the at least one membrane property, the method comprising the following steps:
 - a) generating at least one fast-transient voltage signal and applying the fast-transient voltage signal to the measurement electrodes (114);
 - 10 b) measuring at least one response signal;
 - c) determining the at least one membrane property by evaluating of the response signal.
- 15 2. The method according to claim 1, wherein the evaluating of the response signal comprises determining equivalent series resistance of the analyte sensor (112) and determining the at least one membrane property from the equivalent series resistance of the analyte sensor (112).
- 20 3. The method according to any one of claims 1 or 2, wherein the analyte sensor (112) is an in vivo sensor.
4. The method according to any one of claims 1 to 3, wherein the method is performed during in vivo measurement.
- 25 5. The method according to any one of claims 1 to 4, wherein the method is performed during manufacturing of the analyte sensor (112).
6. The method according to any one of claims 1 to 5, wherein the method comprises at least one failsafe step, wherein the failsafe step is triggered depending on the
30 determined membrane property.
7. The method according to any one of claims 1 to 6, wherein the membrane property is permeability of the membrane element (122).
- 35 8. The method according to any one of claims 1 to 7, wherein the fast-transient voltage signal has a square wave form or a sine wave signal form.

9. The method according to any one of claims 1 to 8, wherein the fast-transient voltage signal comprises a non-continuous signal such as a pulse, wherein a pulse duration is $\leq 20 \mu\text{s}$, preferably $\leq 10 \mu\text{s}$.
- 5 10. Method for determining a concentration of at least one analyte in body fluid using at least one analyte sensor (112), wherein the analyte sensor (112) comprises at least two measurement electrodes (114), wherein at least one of the measurement electrodes (114) comprises at least one membrane element (122) having at least one membrane property, wherein the method comprises determining at least one
10 membrane property of the analyte sensor (112) according to any one of claims 1 to 9, wherein the method comprises at least one analyte measurement step, wherein in the measurement step at least one measurement value of the concentration of the analyte is determined.
- 15 11. A computer program comprising program means for performing the method according to any one of claims 1 to 9 and/or the method according to claim 10 while the computer program is being executed on a computer or on a computer network.
- 20 12. An analytical system (110) for determining a concentration of at least one analyte in body fluid, wherein the analytical system (110) comprises at least one analyte sensor (112), wherein the analyte sensor (112) comprises at least two measurement electrodes (114), wherein at least one of the measurement electrodes (114) comprises at least one membrane element (122) having at least one membrane property, wherein the analytical system (110) comprises at least one signal generator
25 device (124) configured for generating at least one fast-transient voltage signal, wherein the signal generator device (124) is configured for applying the fast-transient voltage signal to the two measurement electrodes (114), wherein the analytical system (110) comprises at least one measurement unit (126) configured for receiving at least one response signal, wherein the analytical system (110) comprises at least
30 one evaluation device (132), wherein the evaluation device (132) is configured for determining the at least one membrane property by evaluating of the response signal.
- 35 13. The analytical system (110) according to claim 12, wherein the analyte sensor (112) is a two electrode sensor or a three electrode sensor.

14. The analytical system (110) according to any one of claims 12 or 13, wherein the measurement electrodes (114) are arranged on opposing sides of the analyte sensor (112).
15. The analytical system (110) according to any one of claims 12 to 14, wherein the
5 analytical system (110) is configured for performing the method according to any one of claims 1 to 9 and/or the method according to claim 10.