

## Morphological, Electrical and Chemical Characteristics of Poly(sodium 4-styrenesulfonate) Coated PVDF Ultrafiltration Membranes after Plasma Treatment

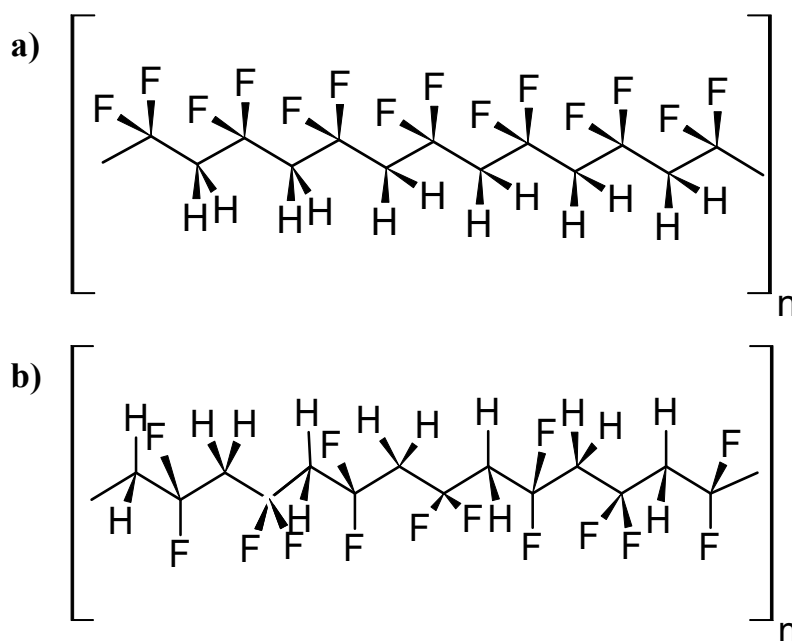


Figure S1. PVDF configurations. a)  $\alpha$  phase and b)  $\beta$  phase.

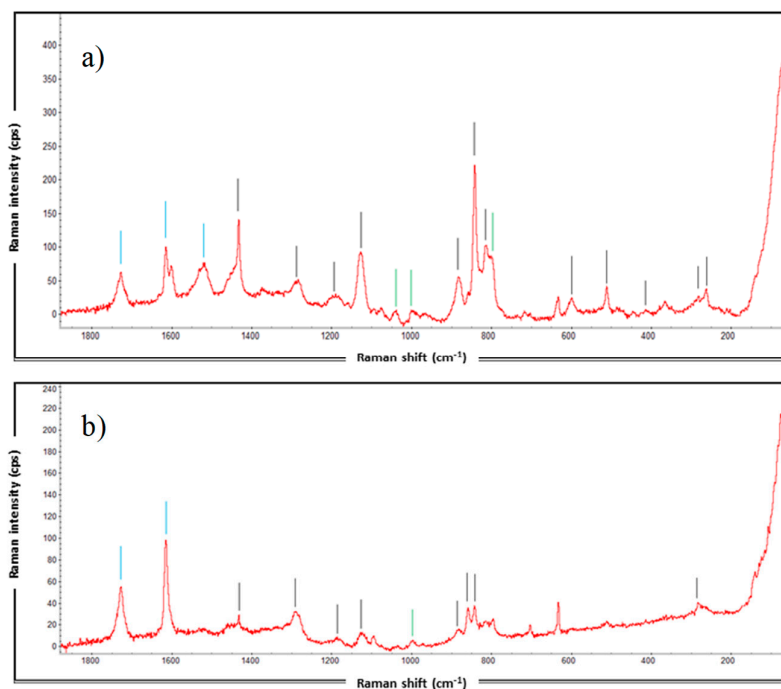


Figure S2. Zoom Raman spectra of a) HFM-183+PSS and b) HFM-183+PSS+Ar.

Table S1. Peaks in the Raman spectra.

| PVDF Film Raman Shift (cm <sup>-1</sup> ) | Peak  | HFM-183 Raman Shift (cm <sup>-1</sup> ) | Peak                                 | HFM-183+PSS Raman Shift (cm <sup>-1</sup> ) | Peak                                 | HFM-183+PSS+Ar Raman Shift (cm <sup>-1</sup> ) | Peak                                 |
|---|---|---|--------------------------------------|---|--------------------------------------|--|--------------------------------------|
| 3010                                      | CH asymmetric stretching  | 3010                                    | CH asymmetric stretching             | 3010  | CH asymmetric stretching             | 3010   | CH asymmetric stretching o           |
| 2990                                      | CH symmetric stretching   | 2990                                    | CH symmetric stretching              | 3090  | C-H aromatic, stretching             | 3090   | C-H aromatic, stretching             |
| 1440                                      | CH stretching   | 1730                                    | C=N                                  | 2990  | CH symmetric stretching              | 2990   | CH symmetric stretching              |
| 1300                                      | CF <sub>2</sub> stretching  | 1610                                    | NH <sub>3</sub> out of phase bending | 2900  | C-H aliphatic, stretching            | 2900   | C-H aliphatic, stretching            |
| 1200                                      | CF <sub>2</sub> stretching  | 1520                                    | NH <sub>3</sub> in phase bending     | 1730  | C=N                                  | 1730   | C=N                                  |
| 1150                                      | C-C stretching  | 1440                                    | CH stretching                        | 1610  | NH <sub>3</sub> out of phase bending | 1610   | NH <sub>3</sub> out of phase bending |
| 1080                                      | CH bending  | 1300                                    | CF <sub>2</sub> stretching           | 1520  | NH <sub>3</sub> in phase bending     | 1520   | NH <sub>3</sub> in phase bending     |
| 890                                       | CH bending  | 1200                                    | CF <sub>2</sub> stretching           | 1450  | CH <sub>2</sub> bending              | 1450   | CH <sub>2</sub> bending              |
| 850                                       | CH <sub>2</sub> rocking - CF <sub>2</sub> out of phase stretching | 1150                                    | C-C                                  | 1440  | CH stretching                        | 1440   | CH stretching                        |
| 810                                       | CF <sub>2</sub> in phase**  | 1080                                    | CH bending                           | 1300  | CF <sub>2</sub> stretching           | 1300   | CF <sub>2</sub> stretching           |
| 610                                       | CF <sub>2</sub> bending - CCC out of phase backbone vibration     | 1000                                    | NH stretching                        | 1200  | CF <sub>2</sub> stretching           | 1200   | CF <sub>2</sub> stretching           |

|     |  |     |  |      |  |      |  |
|-----|--|-----|--|------|--|------|--|
| 510 | CF <sub>2</sub> wagging -<br>CF <sub>2</sub> in phase<br>bending | 890 | CH bending   | 1150 | C–C  | 1150 | C–C  |
| 410 | CF <sub>2</sub> twisting   | 850 | CH <sub>2</sub> rocking -<br>CF <sub>2</sub> out of<br>phase<br>stretching | 1080 | CH bending   | 1080 | CH bending   |
| 285 | CF <sub>2</sub> twisting<br>and wagging                          | 810 | CF <sub>2</sub> in phase   | 1030 | -SO <sub>3</sub> <sup>-</sup><br>stretching                                | 1030 | SO <sub>3</sub> stretching   |
| 250 | CF <sub>2</sub> twisting<br>and wagging                          | 610 | CF <sub>2</sub> bending –<br>CCC out of<br>phase<br>backbone<br>vibration  | 1005 | C–C<br>stretching, p-<br>substituted<br>ring                               | 1000 | C–C<br>stretching, p-<br>substituted<br>ring                               |
|     |  | 510 | CF <sub>2</sub> wagging -<br>CF <sub>2</sub> in phase<br>bending           | 1000 | NH stretching  | 1000 | NH stretching  |
|     |  | 410 | CF <sub>2</sub> twisting   | 890  | CH bending   | 890  | CH bending   |
|     |  | 285 | CF <sub>2</sub> twisting<br>and wagging                                    | 850  | CH <sub>2</sub> rocking -<br>CF <sub>2</sub> out of<br>phase<br>stretching | 850  | CH <sub>2</sub> rocking -<br>CF <sub>2</sub> out of<br>phase<br>stretching |
|     |  | 250 | CF <sub>2</sub> twisting<br>and wagging                                    | 810  | CF <sub>2</sub> in phase   | 810  | CF <sub>2</sub> in phase   |
|     |  |     |  | 800  | C–S stretching   | 800  | C–S stretching   |
|     |  |     |  | 610  | CF <sub>2</sub> bending –<br>CCC out of<br>phase<br>backbone<br>vibration  | 610  | CF <sub>2</sub> bending –<br>CCC out of<br>phase<br>backbone<br>vibration  |
|     |  |     |  | 600  | SO <sub>3</sub> bending  | 510  | CF <sub>2</sub> wagging -<br>CF <sub>2</sub> bending<br>in phase           |
|     |  |     |  | 510  | CF <sub>2</sub> wagging -<br>CF <sub>2</sub> in phase<br>bending           | 285  | CF <sub>2</sub> twisting<br>and wagging                                    |
|     |  |     |  | 410  | CF <sub>2</sub> twisting   |      |  |
|     |  |     |  | 285  | CF <sub>2</sub> twisting<br>and wagging                                    |      |  |
|     |  |     |  | 250  | CF <sub>2</sub> twisting<br>and wagging                                    |      |  |