Electronic Supplementary Information (ESI) for

PDMS-Based Flexible and Conductive Composite Films Containing Modified PEDOT:PSS Coated Channels as a Potential Neural Conduit

Orhan Gokalp Buyukuysal[1], Busra Kilic[2], Cagatay Karaaslan[1,2], Dincer Gokcen[3], Cem Bayram[4] and Halil Murat Aydin[1,5]

[1] Bioengineering Division, Institute of Science, Hacettepe University, Ankara, Turkey
[2] Department of Biology, Molecular Biology Section, Hacettepe University, Ankara, Turkey
[3] Department of Electrical and Electronics Engineering, Hacettepe University, Ankara, Turkey
[4] Nanotechnology and Nanomedicine Division, Institute of Science, Hacettepe University, Ankara, Turkey
[5] Centre for Bioengineering, Hacettepe University, Ankara, Turkey

*Corresponding Author:
Prof. Dr. Halil Murat AYDIN
E-mail: hmaydin@hacettepe.edu.tr
Tel: (+90) 312 297 78 00
Bioengineering Division and Centre for Bioengineering,
Hacettepe University, 06800, Ankara, Turkey

9 Pages

1. MATERIALS AND METHOD

1.1. Degradation Test

The degradation test was applied to determine the degradation and dissolution tendencies of the obtained films. The analysis is planned to last 28 days in total. PBS was chosen as the medium. Film samples were cut with a scalpel to have dimensions of 5×5 mm, placed in falcones containing 70% ethanol, cleaned by mixing in a thermoshaker device at 50 rpm at room temperature, dried in a lyophilizer before the process, weighed on a precision scale and their initial weights were noted. The study was conducted on 3 samples in each solution. The samples were placed in a 50 ml falcon and treated at 37°C with a stirring speed of 30 rpm. The pH of the media containing the samples was measured on the 1st, 7th, 14th, 21st, and 28th days of the experiment by removing the samples from the experimental setup, and to understand the weight losses, the samples were washed with deionized water, dried in a lyophilizer, and weighed. Mass loss results were calculated with Equation-1 given below. After the experiment, % weight loss graphs of the films and pH measurements for different days were created and shared under the relevant heading in the results section.

$$\%Mass\ Loss = \frac{W0 - W1}{W0} x\ 100 \quad \textbf{(1)}$$

W0 represents the initial dry weight, W1 represents the final dry weight.

1.2. Swelling Test

The swelling behavior of the composite films was examined by swelling tests. 5x5 mm sized samples cut from the films were tested in a PBS environment. At the beginning of the test, the dry weights of the samples were measured by lyophilizing them at -80oC and then they were kept in PBS for 24 hours. At the end of the 1st, 6th, 12th and 24th hours, after collecting the excess wetness on the samples with filter paper, wet weight measurements were made and graphs were shared in the results section.

$$\%Swelling\ Rate = \frac{H1 - H0}{H0} x\ 100 \quad \textbf{(2)}$$

H1 represents wet weight, H0 represents dry weight.

2. RESULTS AND DISCUSSION

2.1. Atomic Absorption Spectroscopy (AAS)

Calibration curves were prepared based on the prepared iron and sodium standards and the results obtained were interpreted based on the calibration curves. The samples were diluted with deionized water at ratios of 1:10, 1:50 and 1:100, and analyzes were performed on these samples. Since ion determination could not be performed efficiently in samples with 1:10 and 1:50 dilution ratios, the analysis was interpreted on samples with 1:100 dilution ratios.

The absorption reading of iron ion decreased from 0.1584 in the PPAD-BIE sample to 0.0139 in the PPAD-AIE sample. The density reading of sodium ion decreased from 1.2575 in the PPAD-BIE sample to 1.1412 in the PPAD-AIE sample. Looking at the values obtained from the calibration curve, iron ion decreased from 19 ppm to 1 ppm, and sodium ion decreased from 2.5 ppm to 2 ppm.

Table 1. Iron and Sodium Ion Density Measurements for PPAD-BIE and PPSD-AIE.

		1.Absorbance Reading	**2.Absorbance Reading**	**3.Absorbance Reading**	**Average Absorbance**
IRON 1:100	PPAD-BIE	0.1568	0.1592	0.1591	1.1584 ± 0.001
	PPAD-AIE	0.0147	0.0133	0.0136	0.0139 ± 0.0007
SODIUM 1:100	PPAD-BIE	1.2574	1.2577	1.2575	1.2575 ± 0.0001
	PPAD-AIE	1.1390	1.1421	1.1424	1.1412 ± 0.001

As can be seen from the results, it is understood that as a result of the ion exchange process with the dialysis membrane, the majority of the Iron Ion and a certain part of the Sodium Ion are successfully removed from PPAD.

2.2. Fourier Transform Infrared Spectroscopy (FTIR)

There are PEDOT:PSS characteristic peaks in the PPAD-BIE (Blue) and PPAD-AIE (Red) spectra. For both samples, the peaks at 3300 cm^{-1} represent the stretching vibration of hydroxyl groups (O-H)[1], the peaks at 1573 and 1468 cm^{-1} represent the stretching vibration in the conjugated alkene (C = C) structure of PEDOT:PSS polymer[2], The peaks at 1268 cm^{-1} represent the S = O vibration[3], the peaks at 1161, 1117 and 1068 cm^{-1} represent the C-O-C structure vibration[4], the peaks at 864 and 711 cm^{-1} represent the aromatic sulfonate ester group[5]. The biggest difference in the peaks of BIE and AIE samples is that the O-H peak in the AIE spectrum is much weaker compared to BIE. It can be said that the reason for this is the decreasing number of OH^- ions due to the OH^- and H^+ ions combined to form water molecules during the ion exchange process.

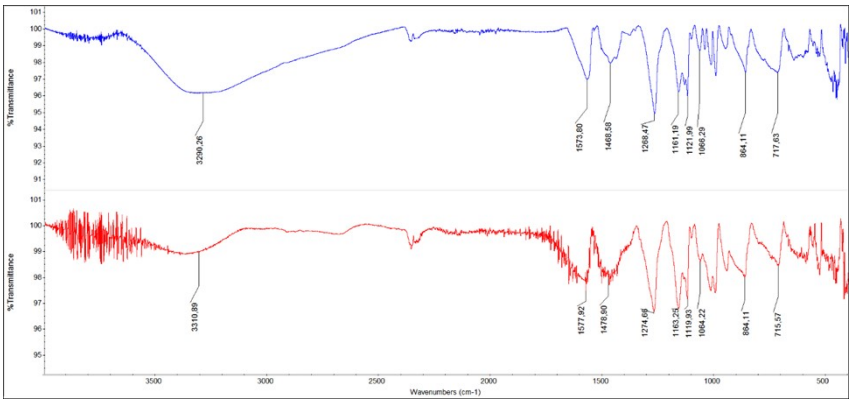

Figure 1. FTIR results of PPAD-BIE and PPAD-AIE.

There are PEDOT:PSS characteristic peaks in the PPAD (Blue) and PPAD/LiTFSI (Red) spectra. The symmetric bending of CF3, C–S, S–N stretching at 744 cm^{-1} and the asymmetric bending of CF_3 at 610 cm^{-1} indicate the presence of LiTFSI in the PPAD content[6]. Other peaks are peaks already present in PPAD.

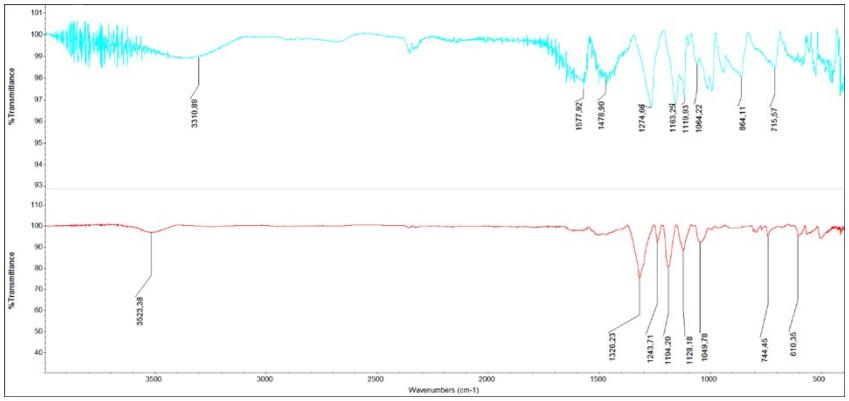

Figure 2. FTIR results of PPAD and PPAD-LiTFSI.

PDMS films match the literature. The peaks at 2963 cm^{-1} and 2901 cm^{-1} both represent the absorption bands of methyl group Si-CH_3 extensions, the peak at 1260 cm^{-1} represents Si-CH3 extensions, the peak at 1008 cm^{-1} represents Si–O–Si extensions; The peak at 849 cm^{-1} represents ≡Si-OH stretching and the peak at 790 cm^{-1} represents –CH_3 vibration absorption[7,8].

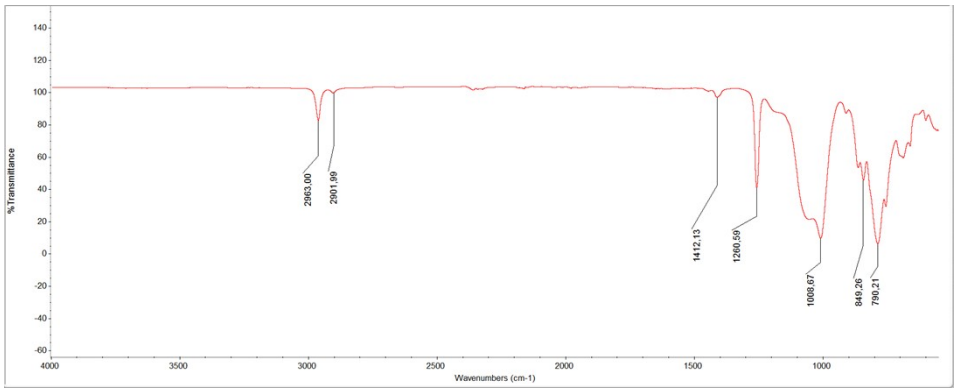

Figure 3. FTIR results of PDMS.

2.3. Electrical Characterizations

2.3.1. Resistance Measurements

Resistance measurements of composite films were obtained as two different parameters, before stretching and after stretching (measurements are recorded when the sample is released). Conventional resistance measurements are done by placing the 4-probe in different parts of each channel. The increase in the resistance of the films after stretching gives an idea about the coating quality. The reason for the increase in resistance after stretching is that conduction paths are partially deformed as a result of cracks occurring in the coatings after stretching.

Looking at the resistance measurements of the PPAD-RAL-EG-PDMS composite film, the resistances of the 4 channels and the top channel above them before stretching are at close values. In measurements after stretching, all regions except channel 1 showed an increase in resistance at values close to each other. The mean values of the resistance measurements are given in the following text.

After stretching, the 1st channel resistance increases from 826.67 Ohm to 4467 Ohm, the 2nd channel resistance increases from 924 Ohm to 2121.67 Ohm, the 3rd channel resistance increases from 894.33 Ohm to 2852 Ohm, the 4th channel resistance increases from 866 Ohm to 2390 Ohm and the top channel resistance increased from 638.33 Ohm to 2730.33 Ohm.

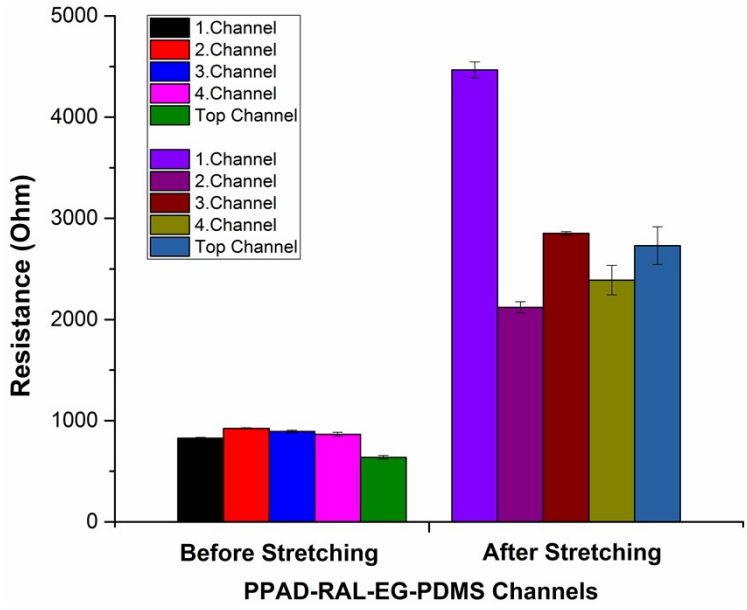

Figure 4. PPAD-AIE-RAL-EG - PDMS before and after stretching resistance measurements.

The resistance values of the PPAD-LiTFSI-RAL-EG-PDMS composite film were higher than the PPAD sample. As explained in the previous sections, this is an expected result. As can

be seen in the SEM images (Figure 9), the high coating thickness caused high resistance measurements as expected.

After stretching, the 1st channel resistance increases from 1561.67 Ohm to 4122.67 Ohm, the 2nd channel resistance increases from 1340.33 Ohm to 1937.67 Ohm, the 3rd channel resistance increases from 1590.33 Ohm to 4536.00 Ohm, the 4th channel resistance increased from 1758.33 Ohm to 4462.67 Ohm and the top channel resistance increased from 1653.00 Ohm to 2205.67 Ohm.

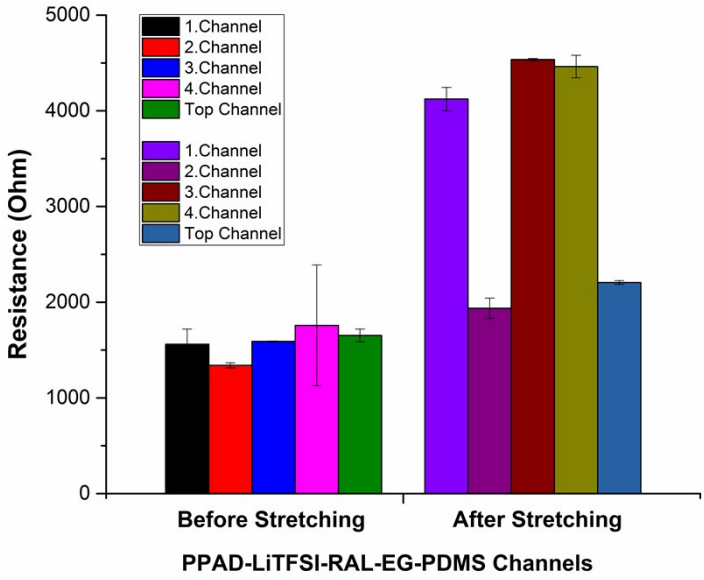

Figure 5. PPAD-LiTFSI-RAL-EG - PDMS before and after stretching resistance measurements.

2.4. Degradation Test

The degradation behavior of the polymer depends on factors such as the types of chemical bonds formed by the mer units and the agitation rate and pH of the environment in which the polymer is placed to degrade. The pH of the medium can change the rate of hydrolysis of chemical bonds, as well as the amount of dissolution of materials[9].

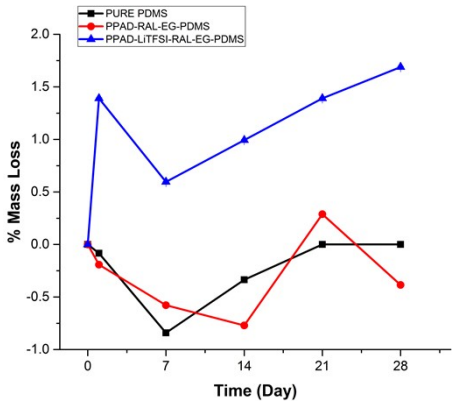

Figure 6. Mass loss results of composite films.

When we examine the PDMS group, it is seen that it has a high resistance to degradation. Since PDMS is a cross-linked polymer[10], this is an expected result. When the obtained graphs are examined, it is seen that in sample groups other than the PPAD-LiTFSI-RAL-EG-PDMS group, the swelling tendency dominates the degradation tendency and the films gain more mass instead of losing mass. It is observed that on days when mass loss occurs, the level does not exceed 0.5%. It is thought that the reason why the PPAD-LiTFSI-RAL-EG group reached a higher mass loss is that the samples used may have various damages and ruptures and therefore the degradation result was higher.

Degradation can also be defined as the emergence of monomers in time-buffered environments[9], and pH change can be evaluated through this definition. When we look at the pH change graph of the PDMS group, we see that the pH values increase and decrease consecutively in the form of fluctuations. The reason for this has been interpreted as swelling and degradation tendencies dominating each other on certain days. There was no significant change in PBS pH on the 1st day, but it was observed that the pH decreased on the 7th day. It can be said that the conductive polymer coatings on the surface of the composite films are separated from the surface and the H+ ion density in the PBS increases and therefore the acidity value increases. On the 14th day, results parallel to the 7th day were obtained, but although a slight increase in pH was observed on the 21st day, the pH values on the 28th day remained stable in the same band as the results on the 7th and 14th days. It is thought that this fluctuation in pH change is due to the fact that the films tend to swell as they degrade.

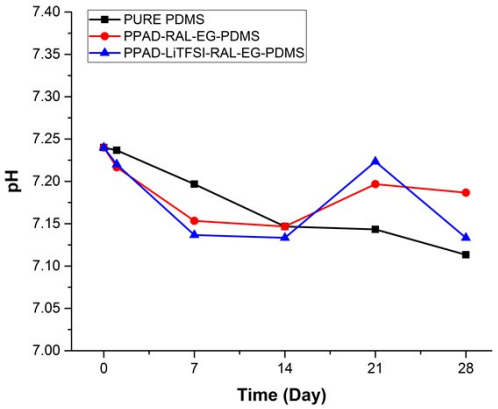

Figure 7. pH change results of composite films during the degradation test.

2.5. Swelling Test

Swelling properties are important in tissue engineering applications, as inadequate water absorption leads to inhibition of cell growth[11]. When the graphs are examined, it is seen that

the water retention properties of PDMS-based composite films are low. This shows that results matching the literature were obtained[12].

In the swelling test of the PDMS group, it is seen that the swelling tendency of the pure PDMS sample increases slowly linearly compared to the conductive polymer-coated samples. The same behavior was observed in conductive polymer-coated samples, but the swelling ratio resulted to be less. It is thought that the reason for this is that the coatings are removed from the PDMS surface as a result of temperature and shaking movement. It can be seen from the graph that the PPAD-RAL-EG sample is the group that is least removed from the PDMS surface. This shows that the PPAD-RAL-EG coating quality is better than other groups.

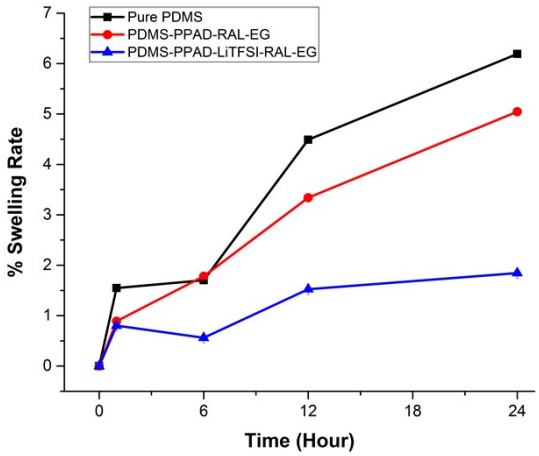

Figure 8. Swelling test results of composite films.

3. REFERENCES

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4. RAW DATA OF THE MANUSCRIPT AND ESI ANALYSES

4.A. MANUSCRIPT ANALYSES

4.A.1. Particle Size Distribution Analysis

4.A.1.1 PPAD-BIE

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0.1	0
0.8332	0	0.2	0
0.9649	0	0.4	0
1.117	0	0.6	0
1.294	0	0.8	0
1.499	0	0.9	0
1.736	0	0.9	0
2.01	0	0.8	0
2.328	0	0.7	0
2.696	0	0.5	0.1
3.122	0	0.3	0.3
3.615	0	0.2	0.6
4.187	0	0.1	0.8
4.849	0	0.1	0.9
5.615	0	0.1	0.9
6.503	0	0.1	0.9
7.531	0	0.1	0.7
8.721	0	0.1	0.5
10.1	0	0.2	0.3
11.7	0	0.1	0.1
13.54	0	0.1	0
15.69	0	0.1	0
18.17	0	0	0
21.04	0.1	0	0
24.36	0.2	0	0
28.21	0.4	0	0
32.67	0.7	0	0
37.84	1	0	0

43.82	1.3	0	0
50.75	1.6	0.1	0
58.77	1.7	0.3	0
68.06	1.7	0.5	0
78.82	1.6	0.8	0
91.28	1.4	1	0
105.7	1.2	1.2	0
122.4	0.9	1.3	0
141.8	0.6	1.3	0
164.2	0.3	1.2	0
190.1	0.1	0.9	0
220.2	0	0.7	0
255	0	0.4	0
295.3	0	0.2	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0
1484	0.4	0.2	0.3
1718	1.4	0.9	1.2
1990	3	2.3	2.9
2305	5.2	4.4	5.3
2669	7.7	7	8.2
3091	10.3	9.8	11.3
3580	12.7	12.4	14.1
4145	14.4	14.4	16.2
4801	15.2	15.5	17.3
5560	14.8	15.3	16.9
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.2 PPAD-BIE

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	1.2
0.7195	0	0	1.1
0.8332	0	0	1.4
0.9649	0	0	1.2
1.117	0	0	0.5
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0

3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	3.1
141.8	7.5	0	26.4
164.2	28.3	9.9	40
190.1	37.9	30.3	25.1
220.2	24	37.3	0.1
255	2.4	21.7	0
295.3	0	0.8	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0
1484	0	0	0
1718	0	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.3 PPAD-RAL

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	2.1	0
18.17	0	3	0
21.04	0	1.5	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0
164.2	0	0	0
190.1	0	0	7
220.2	19.2	0	56.2
255	45.1	14.4	36.8
295.3	34.8	31.8	0
342	0.9	32.3	0
396.1	0	14.9	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0
1484	0	0	0
1718	0	0	0

1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.4 PPAD-RAL-12M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	2.1
8.721	0	0	3.5
10.1	0	0	2.2
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0
164.2	0	2.3	0
190.1	0	17	0

220.2	7	31.2	0
255	19.2	31.4	5.3
295.3	27.9	16.9	16
342	26.5	1.3	24.6
396.1	15.7	0	24.8
458.7	3.8	0	16.2
531.2	0	0	5.2
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0
1484	0	0	0
1718	0	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.5 PPAD-AIE-2M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0

24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0
164.2	0	0	0
190.1	0	0	0
220.2	0	0	0
255	0	0	0
295.3	0	0	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	10
955.4	0	12.4	34.4
1106	11.8	33.2	38.3
1281	32.9	36.3	17.4
1484	36.6	18.1	0
1718	18.7	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.6 PPAD-AIE-12M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	5.6	2.6
0.7195	0	5.9	2.2
0.8332	0	5.5	1.5
0.9649	0	4.4	0.7
1.117	0	3	0.2
1.294	0	1.5	0
1.499	0	0.5	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0

2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0
164.2	0	0	0
190.1	0	0	0
220.2	0	0	0
255	0	0	0
295.3	0	0	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0
1484	0	0	0
1718	0	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	2.7
3580	0	3.4	9
4145	0	11.8	18.1
4801	23.7	23.5	27.8
5560	76.3	34.9	35.3
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.7 PPAD-LiTFSI

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0.9	0	0
2.01	2.9	0	0
2.328	3.4	0	0
2.696	1.8	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0.7	0	0
141.8	13.7	0	0
164.2	27.7	0	0
190.1	29.4	0	0
220.2	17	0	0
255	2.5	0.6	1.1
295.3	0	3.4	3.3
342	0	7.1	5.4
396.1	0	9.4	6.2
458.7	0	9.1	5.2
531.2	0	6.2	3
615.1	0	2.5	0.9
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	0

1484	0	0	0
1718	0	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	3.8	7.5
4801	0	18.1	23.7
5560	0	39.7	43.6
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.8 PPAD-LiTFSI-RAL

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	1.1	0
18.17	0	2.6	0
21.04	0	1.8	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0

164.2	0	0	0
190.1	0	0	0
220.2	0	0	0
255	0	0	0
295.3	0	0	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	7.2	0	0
712.4	83.1	0	0
825	9.7	0	0
955.4	0	18.7	0
1106	0	43.3	9.2
1281	0	32.4	33.6
1484	0	0	38.9
1718	0	0	18.3
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.9 PPAD-LiTFSI-RAL-12M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0

18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0.8	0
105.7	0	1.9	0
122.4	1.1	2.2	0
141.8	2.5	1.3	0
164.2	2.6	0.2	0
190.1	1.2	0	0
220.2	0	0	0
255	0	0	0
295.3	0	0	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	3.8	0
712.4	6.3	12.6	3.4
825	16.9	21.5	15.1
955.4	24.7	24.7	26.7
1106	24.2	19.7	28.9
1281	15.6	9.8	19.6
1484	4.9	1.5	6.4
1718	0	0	0
1990	0	0	0
2305	0	0	0
2669	0	0	0
3091	0	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.1.10 PPAD-LiTFSI-2M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	0	0	0
0.7195	0	0	0
0.8332	0	0	0
0.9649	0	0	0
1.117	0	0	0
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0

2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0
164.2	0	0	0
190.1	0	0	0
220.2	0	0	0
255	0	0	0
295.3	0	0	0
342	0	0	0
396.1	0	0	0
458.7	0	0	0
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0
1106	0	0	0
1281	0	0	30
1484	0	0	53.7
1718	0	0	16.4
1990	7.9	31.5	0
2305	35.8	44.8	0
2669	39.8	23.7	0
3091	16.5	0	0
3580	0	0	0
4145	0	0	0
4801	0	0	0
5560	0	0	0
6439	0	0	0
7456	0	0	0
8635	0	0	0

10000	0	0	0

4.A.1.11 PPAD-LiTFSI-12M

0.4	0	0	0
0.4632	0	0	0
0.5365	0	0	0
0.6213	4.3	0	2.3
0.7195	3.2	0	1.9
0.8332	1.7	0	1.2
0.9649	0.6	0	0.5
1.117	0	0	0.1
1.294	0	0	0
1.499	0	0	0
1.736	0	0	0
2.01	0	0	0
2.328	0	0	0
2.696	0	0	0
3.122	0	0	0
3.615	0	0	0
4.187	0	0	0
4.849	0	0	0
5.615	0	0	0
6.503	0	0	0
7.531	0	0	0
8.721	0	0	0
10.1	0	0	0
11.7	0	0	0
13.54	0	0	0
15.69	0	0	0
18.17	0	0	0
21.04	0	0	0
24.36	0	0	0
28.21	0	0	0
32.67	0	0	0
37.84	0	0	0
43.82	0	0	0
50.75	0	0	0
58.77	0	0	0
68.06	0	0	0
78.82	0	0	0
91.28	0	0	0
105.7	0	0	0
122.4	0	0	0
141.8	0	0	0.2
164.2	0	0.4	0.7
190.1	0	0.9	1.1
220.2	0	1.4	1.4
255	0	1.6	1.4
295.3	0	1.5	1.2
342	0	1	0.8
396.1	0	0.5	0.4
458.7	0	0.1	0.1
531.2	0	0	0
615.1	0	0	0
712.4	0	0	0
825	0	0	0
955.4	0	0	0

1106	0	0	0
1281	0	0	0
1484	0	0	0
1718	0	0	0
1990	0	0	0
2305	0	0	1
2669	0	1.3	3.5
3091	0.5	5	7.5
3580	5.6	11.2	12.4
4145	15.8	18.6	17.4
4801	28.5	25.8	21.5
5560	39.9	30.6	23.6
6439	0	0	0
7456	0	0	0
8635	0	0	0
10000	0	0	0

4.A.2. Zeta Potential Analysis

4.A.2.1 PPAD-BIE

-147	24553.166	-148	14619.332	-149	0
-144	23540.406	-145	20287.078	-146	0
-141	20720.266	-141	22563.041	-142	0
-137	19521.254	-138	19749.658	-139	0
-134	17066.543	-135	14531.653	-135	0
-130	13482.243	-131	11807.622	-132	0
-127	9743.87	-128	10820.009	-128	0
-124	7280.23	-124	10489.063	-125	0
-120	6373.733	-121	10628.616	-121	0
-117	5535.225	-118	11552.854	-118	0
-114	4388.019	-114	10506.571	-114	0
-110	4866.424	-111	5881.768	-111	0
-107	5892.157	-107	2646.346	-107	0
-103	6516.428	-104	3017.622	-104	0
-100	9386.451	-101	5260	-100	0
-96.6	11301.795	-97.3	6318.418	-96.6	0
-93.3	10407.668	-93.9	5836.929	-93.1	0
-89.9	8900.773	-90.5	7897.781	-89.6	0
-86.5	8151.284	-87.1	9985.839	-86	0
-83.1	8788.08	-83.7	10245.366	-82.5	0
-79.7	8753.906	-80.4	11988.557	-79	0
-76.4	10178.915	-77	12602.357	-75.5	0
-73	13948.118	-73.6	12152.467	-72	0
-69.6	17711.814	-70.2	12217.393	-68.4	0
-66.2	20319.779	-66.8	12664.063	-64.9	0
-62.8	20798.742	-63.4	12725.408	-61.4	0
-59.5	19911.088	-60	14610.667	-57.9	0
-56.1	18727.307	-56.6	22883.557	-54.4	0
-52.7	21008.064	-53.3	29090.135	-50.8	0
-49.3	25793.172	-49.9	29627.742	-47.3	7161.588
-45.9	33165.543	-46.5	34303.891	-43.8	47738.859
-42.6	44590.313	-43.1	45099.234	-40.3	123127.875
-39.2	50312.742	-39.7	56042.922	-36.8	210393.188
-35.8	52572.891	-36.3	65911.352	-33.3	312013.063
-32.4	65610.922	-32.9	78933.398	-29.7	386034.438

-29	93735.563	-29.5	92052.398	-26.2	363280.375
-25.7	132217.578	-26.1	107167	-22.7	257648.844
-22.3	157760.984	-22.8	131946.563	-19.2	147951.672
-18.9	164391.969	-19.4	170658.641	-15.7	74801.461
-15.5	174268	-16	209627.813	-12.1	35865.43
-12.1	179628.859	-12.6	208313.984	-8.62	18805.545
-8.76	165280.688	-9.21	174002.578	-5.1	16047.803
-5.38	141541.688	-5.82	143128.078	-1.58	28976.107
-2	122086.563	-2.43	129201.234	1.94	74193.438
1.38	112724.18	0.959	134525.047	5.46	165165.5
4.76	118128.188	4.35	137261.672	8.98	265459.344
8.14	126926.711	7.74	129139.914	12.5	311079.438
11.5	132570.453	11.1	120161.477	16	264220.5
14.9	148705.094	14.5	120387.313	19.5	155660.203
18.3	161692.656	17.9	141386.625	23.1	59738.527
21.7	167621.016	21.3	171893.422	26.6	15578.67
25	173180.188	24.7	193360.563	30.1	2093.845
28.4	159442.172	28.1	201308.813	33.6	0
31.8	125473.141	31.5	185444.906	37.1	0
35.2	96186.016	34.8	147862.594	40.6	0
38.6	80688.805	38.2	113682.617	44.2	0
41.9	65534.531	41.6	94883.445	47.7	0
45.3	50450.434	45	81147.586	51.2	0
48.7	40018.207	48.4	61405.578	54.7	0
52.1	30797.855	51.8	45778.961	58.2	0
55.5	24258.49	55.2	40596.879	61.8	0
58.8	20172.137	58.6	35795.566	65.3	0
62.2	16927.684	61.9	29106.617	68.8	0
65.6	15738.528	65.3	24175.773	72.3	0
69	14970.574	68.7	20730.779	75.8	0
72.3	13067.628	72.1	16072.359	79.4	0
75.7	13434.9	75.5	11684.252	82.9	0
79.1	15564.949	78.9	8644.409	86.4	0
82.5	12358.007	82.3	5926.601	89.9	0
85.9	6077.801	85.7	4129.644	93.4	0
89.2	4797.815	89.1	3115.36	97	0
92.6	5556.451	92.4	2284.91	100	0
96	3416.058	95.8	1645.748	104	0
99.4	1619.589	99.2	1184.204	108	0
103	1389.067	103	0	111	0
106	909.374	106	0	115	0
110	672.279	109	0	118	0
113	324.551	113	0	122	0
116	288.388	116	0	125	0
120	2027.139	120	0	129	0
123	2918.387	123	0	132	0
126	1430.686	126	0	136	0
130	0	130	0	139	
133	0	133	0	143	
137	0	136	0	146	
140	0	140	0	150	
143	0	143	0		
147	0	147	0		

4.A.2.2 PPAD-AIE

-116	0	-113	0	-115	0
-112	0	-110	0	-112	0

-109	0	-106	0	-109	0
-106	0	-103	0	-105	0
-102	0	-99.7	0	-102	0
-99.1	0	-96.4	0	-98.7	0
-95.8	0	-93.1	0	-95.4	0
-92.5	0	-89.8	0	-92.1	0
-89.2	0	-86.5	0	-88.8	0
-85.9	0	-83.2	0	-85.5	0
-82.6	0	-79.9	0	-82.2	0
-79.3	0	-76.6	0	-78.9	0
-76	0	-73.3	0	-75.6	0
-72.7	0	-70	0	-72.3	0
-69.4	0	-66.7	0	-69	0
-66.1	14141.016	-63.4	1100.751	-65.7	0
-62.8	44367.824	-60.1	25240.602	-62.4	12634.783
-59.5	56440.195	-56.8	62458.832	-59	47724.93
-56.2	47733.113	-53.5	72495.258	-55.7	73388.906
-52.9	23699.32	-50.2	40787.395	-52.4	52930.559
-49.6	4035.668	-46.9	11086.529	-49.1	23102.771
-46.3	0	-43.6	1448.901	-45.8	7802.147
-43	0	-40.3	0	-42.5	0
-39.7	0	-37	0	-39.2	0
-36.4	0	-33.7	0	-35.9	0
-33.1	0	-30.4	0	-32.6	0
-29.8	0	-27.1	0	-29.3	0
-26.5	0	-23.8	0	-26	0
-23.2	0	-20.5	0	-22.7	0
-19.9	0	-17.2	0	-19.4	0
-16.6	0	-13.9	0	-16.1	0
-13.3	0	-10.6	0	-12.8	0
-9.95	0	-7.25	0	-9.51	0
-6.65	0	-3.95	0	-6.2	0
-3.35	0	-0.643	0	-2.9	0
-0.0466	0	2.66	0	0.404	0
3.25	0	5.96	0	3.71	0
6.56	0	9.26	0	7.01	0
9.86	0	12.6	0	10.3	0
13.2	0	15.9	0	13.6	0
16.5	0	19.2	0	16.9	0
19.8	0	22.5	0	20.2	0
23.1	0	25.8	0	23.5	0
26.4	0	29.1	0	26.8	0
29.7	0	32.4	0	30.1	0
33	0	35.7	0	33.4	0
36.3	0	39	0	36.7	0
39.6	0	42.3	0	40	0
42.9	0	45.6	0	43.3	0
46.2	0	48.9	0	46.6	0
49.5	0	52.2	0	49.9	0
52.8	0	55.5	0	53.2	0
56.1	0	58.8	0	56.6	0
59.4	0	62.1	0	59.9	0
62.7	0	65.4	0	63.2	0
66	0	68.7	0	66.5	0
69.3	0	72	0	69.8	0
72.6	0	75.3	0	73.1	0
75.9	0	78.6	0	76.4	0
79.2	0	81.9	0	79.7	0

82.5	0	85.2	0	83	0
85.8	0	88.5	0	86.3	0
89.1	0	91.8	0	89.6	0
92.4	0	95.1	0	92.9	0
95.7	0	98.4	0	96.2	0
99	0	102	0	99.5	0
102	0	105	0	103	0
106	0	108	0	106	0
109	0	112	0	109	0
112	0	115	0	113	0
115	0	118	0	116	0
119	0	122	0	119	0
122	0	125	0	123	0
125	0	128	0	126	0
129	0	131	0	129	0
132	0	135	0	133	0
135	0	138	0	136	3581.699
139	5498.4	141	9072.6	139	14081.344
142	13068.521	145	19577.543	142	21401.818
145	15557.294	148	17046.389	146	12314.094
149	12652.614	--	--	149	497.615

4.A.2.3 PPAD-RAL

-148	0	-149	0	-147	0
-145	0	-145	0	-143	0
-142	0	-141	0	-140	0
-138	0	-137	0	-136	0
-135	0	-134	0	-133	0
-131	0	-130	0	-129	0
-128	0	-126	0	-125	0
-124	0	-123	0	-122	0
-121	0	-119	0	-118	0
-118	0	-115	0	-115	0
-114	0	-111	0	-111	0
-111	0	-108	0	-108	0
-107	0	-104	0	-104	0
-104	0	-100	0	-100	0
-101	0	-96.6	0	-96.9	0
-97.1	0	-92.9	0	-93.3	0
-93.7	0	-89.2	0	-89.7	0
-90.3	0	-85.5	0	-86.2	0
-86.8	0	-81.8	0	-82.6	0
-83.4	0	-78.1	0	-79	0
-80	0	-74.3	1021.42	-75.5	0
-76.6	0	-70.6	3970.318	-71.9	0
-73.2	0	-66.9	9084.563	-68.3	1469.656
-69.7	0	-63.2	18241.51	-64.8	5137.91
-66.3	0	-59.5	29804.332	-61.2	11455.906
-62.9	0	-55.8	38736.184	-57.6	20831.229
-59.5	2111.881	-52.1	42105.215	-54.1	37330.184
-56.1	6909.895	-48.4	38613.598	-50.5	55857.777
-52.6	13429.454	-44.7	34606.891	-47	59361.641
-49.2	21866.148	-41	29456.545	-43.4	51612.664
-45.8	34829.371	-37.3	19838.49	-39.8	46545.082
-42.4	48555.66	-33.6	10264.017	-36.3	38232.352
-38.9	49100.84	-29.8	4773.774	-32.7	24324.365
-35.5	41863.07	-26.1	2642.53	-29.1	12714.841

-32.1	35014.094	-22.4	2355.289	-25.6	4784.354
-28.7	23742.596	-18.7	1924.773	-22	267.112
-25.3	11160.742	-15	390.839	-18.4	0
-21.8	4048.823	-11.3	0	-14.9	0
-18.4	1169.878	-7.6	0	-11.3	0
-15	0	-3.89	0	-7.73	0
-11.6	0	-0.185	0	-4.16	0
-8.16	0	3.52	0	-0.594	0
-4.74	0	7.23	0	2.97	0
-1.32	0	10.9	0	6.54	0
2.1	0	14.6	0	10.1	0
5.52	0	18.4	0	13.7	0
8.94	0	22.1	0	17.2	0
12.4	0	25.8	0	20.8	0
15.8	0	29.5	0	24.4	0
19.2	0	33.2	0	27.9	0
22.6	0	36.9	0	31.5	0
26	0	40.6	0	35.1	0
29.5	0	44.3	0	38.6	0
32.9	0	48	0	42.2	0
36.3	0	51.7	0	45.8	0
39.7	0	55.4	0	49.3	0
43.1	0	59.1	0	52.9	0
46.6	0	62.9	0	56.5	0
50	0	66.6	0	60	0
53.4	0	70.3	0	63.6	0
56.8	0	74	0	67.2	0
60.2	0	77.7	0	70.7	0
63.7	0	81.4	0	74.3	0
67.1	0	85.1	0	77.9	0
70.5	0	88.8	0	81.4	0
73.9	0	92.5	0	85	0
77.3	0	96.2	0	88.6	0
80.8	0	99.9	0	92.1	0
84.2	0	104	0	95.7	0
87.6	0	107	0	99.3	0
91	0	111	0	103	0
94.5	0	115	0	106	0
97.9	0	118	0	110	0
101	0	122	0	114	0
105	0	126	0	117	0
108	0	130	0	121	0
112	0	133	0	124	0
115	0	137	0	128	0
118	0	141	0	131	0
122	0	144	0	135	0
125	0	148	0	138	0
129	0	--	--	142	0
132	0	--	--	146	0
135	0	--	--	149	0
139	0	--	--	--	--
142	0	--	--	--	--
146	0	--	--	--	--
149	0	--	--	--	--

4.A.2.4 PPAD-RAL-12M

-149	0	-149	0	-150	0

-145	0	-146	0	-146	0
-142	0	-142	0	-143	0
-139	0	-139	0	-140	0
-136	0	-136	0	-136	0
-132	0	-132	0	-133	0
-129	0	-129	0	-130	0
-126	0	-126	0	-126	0
-122	0	-123	0	-123	0
-119	0	-119	0	-120	0
-116	0	-116	0	-117	0
-112	0	-113	0	-113	0
-109	0	-109	0	-110	0
-106	0	-106	0	-107	0
-103	0	-103	0	-103	0
-99.3	0	-99.4	0	-100	0
-96	0	-96.1	0	-96.7	0
-92.7	0	-92.8	0	-93.4	0
-89.4	0	-89.5	0	-90.1	0
-86.1	0	-86.2	0	-86.8	0
-82.8	0	-82.9	0	-83.5	0
-79.5	0	-79.6	0	-80.2	0
-76.2	0	-76.3	0	-76.9	0
-72.9	0	-73	0	-73.6	0
-69.6	0	-69.7	0	-70.3	0
-66.3	475.659	-66.4	0	-67	212.783
-63	1272.363	-63.1	912.923	-63.7	443.187
-59.7	1472.689	-59.8	1521.491	-60.4	535.324
-56.4	1097.421	-56.5	1946.147	-57.1	169.479
-53.1	1963.582	-53.2	2569.746	-53.8	592.783
-49.8	6440.693	-49.9	3604.499	-50.5	1848.147
-46.5	14837.53	-46.6	6743.247	-47.2	5211.735
-43.2	27729.387	-43.3	12800.216	-43.9	13590.003
-39.9	41002.645	-40	19053.482	-40.6	27298.574
-36.6	48528.293	-36.7	29164.559	-37.3	44704.535
-33.3	47384.125	-33.4	46982.211	-34	53896.602
-30	33668.422	-30.1	51563.418	-30.7	48722.262
-26.7	17437.531	-26.8	39592.973	-27.4	41675.43
-23.4	7744.31	-23.5	33132.824	-24.1	33892.68
-20.1	2007.156	-20.2	28795.98	-20.8	20410.334
-16.8	0	-16.9	18743.852	-17.5	8212.123
-13.5	0	-13.6	8472.72	-14.2	1515.759
-10.2	0	-10.3	2673.34	-10.9	0
-6.85	0	-6.99	725.171	-7.56	0
-3.55	0	-3.69	0	-4.26	0
-0.252	0	-0.39	0	-0.959	0
3.05	0	2.91	0	2.34	0
6.35	0	6.21	0	5.64	0
9.65	0	9.51	0	8.95	0
13	0	12.8	0	12.2	0
16.3	0	16.1	0	15.5	0
19.6	0	19.4	0	18.9	0
22.9	0	22.7	0	22.2	0
26.2	0	26	0	25.5	0
29.5	0	29.3	0	28.8	0
32.8	0	32.6	0	32.1	0
36.1	0	35.9	0	35.4	0
39.4	0	39.2	0	38.7	0
42.7	0	42.5	0	42	0

46	0	45.8	0	45.3	0
49.3	0	49.1	0	48.6	0
52.6	0	52.4	0	51.9	0
55.9	0	55.7	0	55.2	0
59.2	0	59	0	58.5	0
62.5	0	62.3	0	61.8	0
65.8	0	65.6	0	65.1	0
69.1	0	68.9	0	68.4	0
72.4	0	72.2	0	71.7	0
75.7	0	75.5	0	75	0
79	0	78.8	0	78.3	0
82.3	0	82.1	0	81.6	0
85.6	0	85.4	0	84.9	0
88.9	0	88.8	0	88.2	0
92.2	0	92.1	0	91.5	0
95.5	0	95.4	0	94.8	0
98.8	0	98.7	0	98.1	0
102	0	102	0	101	0
105	0	105	0	105	0
109	0	109	0	108	0
112	0	112	0	111	0
115	0	115	0	115	0
119	0	118	0	118	0
122	0	122	0	121	0
125	0	125	0	125	0
128	0	128	0	128	0
132	0	132	0	131	0
135	0	135	0	134	0
138	0	138	0	138	0
142	0	142	0	141	0
145	0	145	0	144	0
148	0	148	0	148	0

4.A.2.5 PPAD-AIE-2M

-149	0	-148	0	-149	0
-145	0	-145	0	-145	0
-142	0	-141	0	-142	0
-139	0	-138	0	-139	0
-135	0	-135	0	-135	0
-132	0	-131	0	-132	0
-129	0	-128	0	-129	0
-125	0	-125	0	-125	0
-122	0	-121	0	-122	0
-119	0	-118	0	-119	0
-116	0	-115	0	-115	0
-112	0	-112	0	-112	0
-109	0	-108	0	-109	0
-106	0	-105	0	-106	0
-102	0	-102	0	-102	0
-99.1	0	-98.3	0	-99	0
-95.8	0	-95	0	-95.7	0
-92.5	0	-91.7	0	-92.4	0
-89.2	0	-88.4	0	-89.1	0
-85.8	0	-85.1	0	-85.8	0
-82.5	0	-81.8	0	-82.5	0
-79.2	0	-78.5	0	-79.2	0
-75.9	0	-75.2	0	-75.9	0

-72.6	0	-71.9	0	-72.6	0
-69.3	0	-68.6	0	-69.3	0
-66	0	-65.3	0	-66	0
-62.7	0	-62	0	-62.7	0
-59.4	1140.792	-58.7	836.099	-59.4	770.646
-56.1	2432.931	-55.4	3253.43	-56.1	2259.83
-52.8	6846.625	-52.1	7056.69	-52.8	10166.047
-49.5	17813.42	-48.8	12827.917	-49.4	25211.629
-46.2	33484.34	-45.5	19853.916	-46.1	40644.629
-42.9	50862.215	-42.2	29123.469	-42.8	59330.934
-39.6	63174.223	-38.9	45695.41	-39.5	67060.469
-36.3	68045.477	-35.6	59638.883	-36.2	60400.871
-33	70677.531	-32.3	58384.613	-32.9	56817.848
-29.7	66110.633	-29	50627.477	-29.6	55393.488
-26.4	54268.941	-25.7	43177.223	-26.3	55272.539
-23.1	44939.234	-22.4	39574.418	-23	47417.805
-19.8	34760.773	-19.1	36941.715	-19.7	29787.979
-16.5	18530.277	-15.8	22905.602	-16.4	15374.55
-13.2	7002.356	-12.5	8102.833	-13.1	5839.005
-9.93	2590.064	-9.19	2652.482	-9.82	933.807
-6.63	0	-5.89	374.525	-6.52	0
-3.33	0	-2.59	0	-3.21	0
-0.032	0	0.711	0	0.0892	0
3.27	0	4.01	0	3.39	0
6.57	0	7.31	0	6.69	0
9.87	0	10.6	0	10	0
13.2	0	13.9	0	13.3	0
16.5	0	17.2	0	16.6	0
19.8	0	20.5	0	19.9	0
23.1	0	23.8	0	23.2	0
26.4	0	27.1	0	26.5	0
29.7	0	30.4	0	29.8	0
33	0	33.7	0	33.1	0
36.3	0	37	0	36.4	0
39.6	0	40.3	0	39.7	0
42.9	0	43.6	0	43	0
46.2	0	46.9	0	46.3	0
49.5	0	50.2	0	49.6	0
52.8	0	53.5	0	52.9	0
56.1	0	56.8	0	56.2	0
59.4	0	60.1	0	59.5	0
62.7	0	63.4	0	62.8	0
66	0	66.7	0	66.1	0
69.3	0	70	0	69.4	0
72.6	0	73.4	0	72.7	0
75.9	0	76.7	0	76	0
79.2	0	80	0	79.3	0
82.5	0	83.3	0	82.7	0
85.8	0	86.6	0	86	0
89.1	0	89.9	0	89.3	0
92.4	0	93.2	0	92.6	0
95.7	0	96.5	0	95.9	0
99	0	99.8	0	99.2	0
102	0	103	0	102	0
106	0	106	0	106	0
109	0	110	0	109	0
112	0	113	0	112	0
115	0	116	0	116	0

119	0	120	0	119	0
122	0	123	0	122	0
125	0	126	0	126	0
129	0	129	0	129	0
132	0	133	0	132	0
135	0	136	0	135	0
139	0	139	0	139	0
142	0	143	0	142	0
145	0	146	0	145	0
148	0	149	0	149	0

4.A.2.6 PPAD-AIE-12M

-147	0	-148	0	-149	0
-144	0	-144	0	-146	0
-140	0	-141	0	-143	0
-137	0	-138	0	-140	0
-134	0	-134	0	-136	0
-130	0	-131	0	-133	0
-127	0	-128	0	-130	0
-124	19.669	-124	0	-126	0
-120	261.576	-121	0	-123	0
-117	204.833	-118	0	-120	0
-114	957.517	-115	0	-116	170.958
-111	1540.388	-111	0	-113	721.029
-107	346.232	-108	0	-110	2894.56
-104	0	-105	440.313	-107	7074.841
-101	0	-101	1926.261	-103	13594.247
-97.3	0	-98	4780.802	-99.9	20399.121
-94	0	-94.7	10188.403	-96.6	21026.879
-90.7	0	-91.4	14426.807	-93.3	17019.586
-87.4	1657.69	-88.1	14725.913	-90	13283.076
-84.1	4118.004	-84.8	13439.438	-86.7	8406.854
-80.8	7311.334	-81.5	11740.02	-83.4	3305.677
-77.5	8172.343	-78.2	8365.596	-80.1	544.677
-74.2	7399.683	-74.9	4511.29	-76.8	0
-70.9	9163.975	-71.6	1858.464	-73.5	0
-67.6	10742.027	-68.3	0	-70.2	0
-64.3	8357.912	-65	0	-66.9	0
-61	4928.044	-61.7	0	-63.6	0
-57.7	3115.959	-58.4	0	-60.3	0
-54.4	1390.412	-55.1	0	-57	0
-51.1	0	-51.8	0	-53.7	0
-47.8	0	-48.5	0	-50.4	0
-44.5	0	-45.2	0	-47.1	0
-41.2	0	-41.9	0	-43.8	0
-37.9	0	-38.6	0	-40.5	0
-34.6	0	-35.3	0	-37.2	0
-31.3	0	-32	0	-33.9	0
-28	527.534	-28.7	0	-30.6	0
-24.7	2476.628	-25.4	0	-27.3	0
-21.4	5741.797	-22.1	275.64	-24	0
-18.1	10983.361	-18.8	1803.293	-20.7	0
-14.8	16234.024	-15.5	6143.839	-17.4	702.51
-11.5	22335.371	-12.2	10451.127	-14.1	3867.325
-8.19	30414.818	-8.9	14581.388	-10.8	10845.725
-4.89	36930.016	-5.59	22036.158	-7.47	24061.479
-1.59	39828.902	-2.29	27897.086	-4.17	38435.723

1.71	43960.191	1.01	35143.488	-0.866	47867.074
5.01	41593.703	4.31	44232.457	2.44	56131.617
8.31	24884.053	7.61	42186.848	5.74	55482.242
11.6	10518.233	10.9	27308.16	9.04	37729.387
14.9	4888.391	14.2	12994.421	12.3	18991.029
18.2	1701.455	17.5	6853.829	15.6	8587.912
21.5	96.937	20.8	3631.479	18.9	2600.943
24.8	0	24.1	933.707	22.2	0
28.1	0	27.4	0	25.6	0
31.4	0	30.7	0	28.9	0
34.7	0	34	0	32.2	0
38	0	37.3	0	35.5	0
41.3	0	40.6	0	38.8	0
44.6	0	43.9	0	42.1	0
47.9	0	47.2	0	45.4	0
51.2	0	50.5	0	48.7	0
54.5	0	53.8	0	52	0
57.8	0	57.1	0	55.3	0
61.1	0	60.4	0	58.6	0
64.4	0	63.7	0	61.9	0
67.7	0	67	0	65.2	0
71	0	70.3	0	68.5	0
74.3	0	73.6	0	71.8	0
77.6	0	76.9	0	75.1	0
80.9	0	80.2	0	78.4	0
84.2	0	83.5	0	81.7	0
87.5	0	86.9	0	85	0
90.8	0	90.2	0	88.3	0
94.1	0	93.5	0	91.6	0
97.4	0	96.8	0	94.9	0
101	0	100	0	98.2	0
104	0	103	0	102	0
107	0	107	0	105	0
111	0	110	0	108	0
114	0	113	0	111	0
117	0	117	0	115	0
121	0	120	0	118	0
124	0	123	0	121	0
127	0	126	0	125	0
130	0	130	0	128	0
134	0	133	0	131	0
137	0	136	0	135	0
140	0	140	0	138	0
144	0	143	0	141	0
147	0	146	0	144	0
		150	0	148	0

4.A.2.7 PPAD-LiTFSI

-143	0	-145	0	-142	0
-140	0	-142	0	-138	0
-137	0	-138	0	-135	0
-133	0	-135	0	-131	0
-130	0	-132	0	-128	0
-127	0	-128	0	-125	0
-124	0	-125	0	-121	0
-120	0	-122	0	-118	0
-117	0	-118	0	-114	0

-114	0	-115	0	-111	0
-110	0	-112	0	-108	0
-107	0	-108	0	-104	0
-104	0	-105	0	-101	0
-100	0	-102	0	-97.6	0
-97.1	0	-98.5	0	-94.2	0
-93.8	0	-95.2	0	-90.8	0
-90.5	2492.988	-91.8	0	-87.4	0
-87.2	6301.308	-88.5	0	-84.1	767.704
-83.9	8230.181	-85.2	2071.441	-80.7	5043.635
-80.6	9513.003	-81.9	11099.619	-77.3	18649.295
-77.3	11945.568	-78.5	51354.152	-73.9	46299.969
-74	29804.545	-75.2	102285.414	-70.5	74696.133
-70.7	47296.449	-71.9	91915.688	-67.2	72712.469
-67.4	32336.234	-68.6	42478.473	-63.8	39234.449
-64.1	10301.055	-65.2	17404.527	-60.4	14463.496
-60.8	4189.107	-61.9	10242.528	-57	4077.77
-57.5	1483.074	-58.6	4425.692	-53.6	0
-54.2	279.29	-55.3	0	-50.3	0
-50.9	1233.846	-51.9	0	-46.9	0
-47.6	239.201	-48.6	0	-43.5	0
-44.3	0	-45.3	0	-40.1	0
-41	0	-42	0	-36.7	0
-37.7	0	-38.7	0	-33.4	0
-34.4	0	-35.3	0	-30	0
-31.1	0	-32	0	-26.6	0
-27.8	0	-28.7	0	-23.2	0
-24.5	0	-25.4	0	-19.8	0
-21.2	0	-22	0	-16.5	0
-17.9	0	-18.7	0	-13.1	0
-14.6	0	-15.4	0	-9.69	0
-11.3	0	-12.1	0	-6.31	0
-7.96	0	-8.73	0	-2.93	0
-4.66	0	-5.41	0	0.453	0
-1.36	0	-2.08	0	3.83	0
1.94	0	1.24	0	7.21	0
5.24	0	4.57	0	10.6	0
8.54	0	7.89	0	14	0
11.8	0	11.2	0	17.4	0
15.1	0	14.5	0	20.7	0
18.4	0	17.9	0	24.1	0
21.7	0	21.2	0	27.5	0
25.1	0	24.5	0	30.9	0
28.4	0	27.8	0	34.3	0
31.7	0	31.2	0	37.6	0
35	0	34.5	0	41	0
38.3	0	37.8	0	44.4	0
41.6	0	41.1	0	47.8	0
44.9	0	44.5	0	51.2	0
48.2	0	47.8	0	54.5	0
51.5	0	51.1	0	57.9	0
54.8	0	54.4	0	61.3	0
58.1	0	57.8	0	64.7	0
61.4	0	61.1	0	68.1	0
64.7	0	64.4	0	71.4	0
68	0	67.7	0	74.8	0
71.3	0	71.1	0	78.2	0
74.6	0	74.4	0	81.6	0

77.9	0	77.7	0	85	0
81.2	0	81	0	88.3	0
84.5	0	84.4	0	91.7	0
87.8	0	87.7	131.342	95.1	0
91.1	159.128	91	3242.365	98.5	256.362
94.4	3206.453	94.3	6094.125	102	6211.74
97.7	13930.41	97.7	18283.383	105	18139.961
101	21870.168	101	46412.406	109	34466.613
104	14448.385	104	53016.891	112	34754.875
108	5913.007	108	24210.439	115	20387.23
111	4522.319	111	1804.698	119	6185.094
114	3884.602	114	0	122	0
117	2574.392	118	0	126	0
121	895.033	121	0	129	0
124	0	124	0	132	0
127	0	128	0	136	0
131	0	131	0	139	0
134	0	134	0	142	0
137	0	138	0	146	0
141	0	141	0	149	0
144	0	144	0	--	--
147	0	148	0	--	--

4.A.2.8 PPAD-LiTFSI-RAL

-149	0	-148	0	-148	0
-146	0	-145	0	-145	0
-142	0	-142	0	-141	0
-139	0	-138	0	-138	0
-136	0	-135	0	-135	0
-132	0	-132	0	-131	0
-129	0	-128	0	-128	0
-126	0	-125	0	-125	0
-123	0	-122	0	-121	0
-119	0	-119	0	-118	0
-116	0	-115	0	-115	0
-113	0	-112	0	-112	0
-109	0	-109	0	-108	0
-106	0	-105	0	-105	0
-103	0	-102	0	-102	0
-99.6	0	-98.8	0	-98.4	0
-96.3	0	-95.5	0	-95.1	0
-93	0	-92.2	0	-91.8	0
-89.7	0	-88.9	0	-88.5	0
-86.4	0	-85.6	0	-85.2	0
-83.1	0	-82.3	0	-81.9	0
-79.8	0	-79	0	-78.6	0
-76.6	0	-75.7	0	-75.3	0
-73.3	0	-72.4	0	-72.1	0
-70	0	-69.1	0	-68.8	0
-66.7	0	-65.8	0	-65.5	0
-63.4	0	-62.5	0	-62.2	0
-60.1	0	-59.3	0	-58.9	0
-56.8	237.926	-56	0	-55.6	0
-53.5	0	-52.7	0	-52.3	316.393
-50.2	0	-49.4	0	-49	612.556
-46.9	0	-46.1	0	-45.7	5768.708
-43.6	0	-42.8	0	-42.4	12215.343

-40.4	0	-39.5	0	-39.1	16584.322
-37.1	0	-36.2	1518.569	-35.8	23553.859
-33.8	6887.18	-32.9	10283.428	-32.5	32627.893
-30.5	27715.809	-29.6	44137.277	-29.2	50208.621
-27.2	66751.75	-26.3	91056.133	-25.9	64306.844
-23.9	109251.305	-23	101662.039	-22.6	61762.066
-20.6	120432.594	-19.8	88957.508	-19.3	58309.332
-17.3	91901.906	-16.5	70878.281	-16	49410.066
-14	50254.855	-13.2	40567.352	-12.7	35850.238
-10.7	21089.332	-9.88	16214.93	-9.44	33353.734
-7.45	6155.068	-6.59	5360.332	-6.14	30128.951
-4.16	0	-3.3	0	-2.85	17859.117
-0.865	0	-0.00467	0	0.45	10008.648
2.43	0	3.29	0	3.75	7428.231
5.72	0	6.58	0	7.04	3046.619
9.01	0	9.87	0	10.3	0
12.3	0	13.2	0	13.6	0
15.6	0	16.5	0	16.9	0
18.9	0	19.7	0	20.2	0
22.2	0	23	0	23.5	0
25.5	0	26.3	0	26.8	0
28.8	0	29.6	0	30.1	0
32	0	32.9	0	33.4	0
35.3	0	36.2	0	36.7	0
38.6	0	39.5	0	40	0
41.9	0	42.8	0	43.3	0
45.2	0	46.1	0	46.6	0
48.5	0	49.4	0	49.9	0
51.8	0	52.7	0	53.2	0
55.1	0	56	0	56.5	0
58.4	0	59.2	0	59.8	0
61.7	0	62.5	0	63.1	0
64.9	0	65.8	0	66.4	0
68.2	0	69.1	0	69.7	0
71.5	0	72.4	0	73	0
74.8	0	75.7	0	76.2	0
78.1	0	79	0	79.5	0
81.4	0	82.3	0	82.8	0
84.7	0	85.6	0	86.1	0
88	0	88.9	0	89.4	0
91.3	0	92.2	0	92.7	0
94.6	0	95.5	0	96	0
97.9	0	98.7	0	99.3	0
101	0	102	0	103	0
104	0	105	0	106	0
108	0	109	0	109	0
111	0	112	0	112	0
114	0	115	0	116	0
118	0	118	0	119	0
121	0	122	0	122	0
124	0	125	0	126	0
127	0	128	0	129	0
131	0	132	0	132	0
134	0	135	0	136	0
137	0	138	0	139	0
141	0	142	0	142	0
144	0	145	0	145	0
147	0	148	0	149	0

4.A.2.9 PPAD-LiTFSI-RAL-12M

-150	0	-148	0	-148	0
-146	0	-145	0	-145	0
-143	0	-142	0	-141	0
-140	0	-138	0	-138	0
-136	0	-135	0	-135	0
-133	0	-132	0	-131	0
-130	0	-129	0	-128	0
-127	0	-125	0	-125	0
-123	0	-122	0	-121	0
-120	0	-119	0	-118	0
-117	0	-115	0	-115	0
-113	0	-112	0	-112	0
-110	0	-109	0	-108	0
-107	0	-105	0	-105	0
-104	0	-102	0	-102	0
-100	0	-98.8	0	-98.4	0
-97	0	-95.5	0	-95.1	0
-93.7	0	-92.2	0	-91.8	0
-90.4	0	-88.9	0	-88.4	0
-87.1	0	-85.6	0	-85.1	0
-83.8	0	-82.3	0	-81.8	0
-80.5	0	-78.9	0	-78.5	0
-77.2	0	-75.6	0	-75.2	0
-73.9	0	-72.3	0	-71.9	0
-70.6	0	-69	0	-68.6	0
-67.3	0	-65.7	0	-65.3	0
-64	0	-62.4	0	-62	0
-60.8	0	-59.1	0	-58.7	0
-57.5	0	-55.8	0	-55.4	0
-54.2	0	-52.5	0	-52.1	0
-50.9	0	-49.2	0	-48.8	0
-47.6	0	-45.9	0	-45.5	0
-44.3	0	-42.6	0	-42.2	736.28
-41	0	-39.3	669.742	-38.9	1882.359
-37.7	5159	-36	2502.427	-35.6	6124.278
-34.4	15987.623	-32.7	5860.004	-32.3	17315.396
-31.1	26286.709	-29.4	13622.25	-29	37268.391
-27.8	36631.297	-26.1	26536.941	-25.7	51222.957
-24.5	57774.207	-22.8	39876.32	-22.4	49343.648
-21.3	71146.594	-19.5	45144.035	-19	41395.875
-18	55549.621	-16.2	38329.832	-15.7	27133.453
-14.7	31590.688	-12.9	27363.648	-12.4	11503.2
-11.4	15524.393	-9.57	17886.258	-9.13	4161.801
-8.09	8041.21	-6.27	10205.915	-5.83	1508.543
-4.8	5605.127	-2.97	5893.59	-2.52	194.984
-1.51	3436.936	0.337	3898.038	0.781	0
1.78	1813.978	3.64	2267.838	4.09	0
5.07	718.392	6.94	1257.85	7.39	0
8.36	0	10.2	443.083	10.7	0
11.7	0	13.6	0	14	0
14.9	0	16.9	0	17.3	0
18.2	0	20.2	0	20.6	0
21.5	0	23.5	0	23.9	0
24.8	0	26.8	0	27.2	0
28.1	0	30.1	0	30.5	0

31.4	0	33.4	0	33.8	0
34.7	0	36.7	0	37.1	0
38	0	40	0	40.4	0
41.3	0	43.3	0	43.7	0
44.6	0	46.6	0	47	0
47.9	0	49.9	0	50.4	0
51.2	845.141	53.2	0	53.7	0
54.4	2754.689	56.5	0	57	0
57.7	3009.933	59.8	0	60.3	0
61	0	63.1	0	63.6	0
64.3	0	66.4	0	66.9	0
67.6	0	69.7	0	70.2	0
70.9	0	73	0	73.5	0
74.2	610.815	76.3	0	76.8	0
77.5	0	79.6	0	80.1	0
80.8	0	82.9	0	83.4	0
84.1	0	86.2	0	86.7	0
87.4	0	89.5	0	90	0
90.6	0	92.8	0	93.3	0
93.9	0	96.1	0	96.6	0
97.2	0	99.4	0	99.9	0
101	0	103	0	103	0
104	0	106	0	107	0
107	0	109	0	110	0
110	0	113	0	113	0
114	0	116	0	116	0
117	0	119	0	120	0
120	0	123	0	123	0
124	0	126	0	126	0
127	0	129	0	130	0
130	0	132	0	133	0
133	0	136	0	136	0
137	0	139	0	140	0
140	0	142	0	143	0
143	0	146	0	146	0
147	0	149	0	149	0
150	0				

4.A.2.10 PPAD-LiTFSI-2M

-148	0	--	--	--	--
-145	0	--	--	--	--
-141	0	--	--	--	--
-138	0	--	--	--	--
-135	0	--	--	--	--
-132	0	--	--	--	--
-128	0	--	--	--	--
-125	0	--	--	--	--
-122	0	--	--	--	--
-118	0	--	--	--	--
-115	0	--	--	--	--
-112	0	--	--	--	--
-109	0	-148	0	-149	0
-105	0	-144	0	-146	0
-102	0	-141	0	-143	0
-98.6	0	-138	0	-139	0
-95.3	0	-134	0	-136	0
-92.1	0	-131	0	-133	0

-88.8	0	-128	0	-129	0
-85.5	0	-125	0	-126	0
-82.2	0	-121	0	-123	0
-78.9	0	-118	0	-120	0
-75.6	0	-115	0	-116	0
-72.3	0	-111	0	-113	0
-69	0	-108	0	-110	0
-65.7	0	-105	0	-106	0
-62.4	0	-101	0	-103	0
-59.1	0	-98.2	0	-99.7	0
-55.9	0	-94.9	0	-96.4	0
-52.6	0	-91.6	0	-93.1	0
-49.3	0	-88.3	0	-89.8	0
-46	0	-85	0	-86.5	0
-42.7	0	-81.7	0	-83.2	0
-39.4	0	-78.4	0	-79.9	0
-36.1	0	-75.1	0	-76.6	0
-32.8	0	-71.8	0	-73.3	0
-29.5	0	-68.5	0	-70	0
-26.2	0	-65.3	0	-66.7	0
-22.9	8976.428	-62	0	-63.4	0
-19.7	51704.813	-58.7	0	-60.1	0
-16.4	133883.594	-55.4	0	-56.8	0
-13.1	188834.391	-52.1	0	-53.5	0
-9.78	144590.078	-48.8	0	-50.2	0
-6.49	60902.801	-45.5	0	-46.9	0
-3.2	14169.55	-42.2	0	-43.6	0
0.0934	0	-38.9	0	-40.3	0
3.38	0	-35.6	0	-37	0
6.68	0	-32.3	0	-33.7	0
9.97	0	-29	0	-30.4	0
13.3	0	-25.8	0	-27.1	2418.796
16.5	0	-22.5	0	-23.8	13117.041
19.8	0	-19.2	0	-20.5	39218.156
23.1	0	-15.9	115.573	-17.2	90254.492
26.4	0	-12.6	13537.176	-13.9	128898.391
29.7	0	-9.29	47201.828	-10.6	106704.133
33	0	-6	93310.844	-7.35	55527.992
36.3	0	-2.71	130111.969	-4.05	22361.084
39.6	0	0.582	137981.953	-0.75	7165.441
42.9	0	3.87	111471.828	2.55	177.453
46.2	0	7.17	65476.891	5.85	0
49.5	0	10.5	19907.85	9.15	0
52.8	0	13.7	0	12.4	0
56	0	17	0	15.7	0
59.3	0	20.3	0	19	0
62.6	0	23.6	0	22.3	0
65.9	0	26.9	0	25.6	0
69.2	0	30.2	0	28.9	0
72.5	0	33.5	0	32.2	0
75.8	0	36.8	0	35.5	0
79.1	0	40.1	0	38.8	0
82.4	0	43.4	0	42.1	0
85.7	0	46.7	0	45.4	0
89	0	50	0	48.7	0
92.2	0	53.3	0	52	0
95.5	0	56.5	0	55.3	0
98.8	0	59.8	0	58.6	0

102	0	63.1	0	61.9	0
105	0	66.4	0	65.2	0
109	0	69.7	0	68.5	0
112	0	73	0	71.8	0
115	0	76.3	0	75.1	0
119	0	79.6	0	78.4	0
122	0	82.9	0	81.7	0
125	0	86.2	0	85	0
128	0	89.5	0	88.3	0
132	0	92.8	0	91.6	0
135	0	96	0	94.9	0
138	0	99.3	0	98.2	0
142	0	103	0	102	0
145	0	106	0	105	0
148	0	109	0	108	0
--	--	113	0	111	0
--	--	116	0	115	0
--	--	119	0	118	0
--	--	122	0	121	0
--	--	126	0	125	0
--	--	129	0	128	0
--	--	132	0	131	0
--	--	136	0	135	0
--	--	139	0	138	0
--	--	142	0	141	0
--	--	145	0	144	0
--	--	149	0	148	0

4.A.2.11 PPAD-LiTFSI-12M

-150	0	-147	0	-148	0
-147	0	-144	0	-145	0
-143	0	-140	0	-141	0
-140	0	-137	0	-138	0
-137	0	-134	0	-135	0
-133	0	-130	0	-131	0
-130	0	-127	0	-128	0
-127	0	-124	0	-125	0
-124	0	-121	0	-122	0
-120	0	-117	0	-118	0
-117	0	-114	0	-115	0
-114	0	-111	0	-112	0
-110	0	-107	0	-108	0
-107	0	-104	0	-105	0
-104	0	-101	0	-102	0
-100	0	-97.5	0	-98.6	0
-97.2	0	-94.2	0	-95.3	0
-93.9	0	-91	0	-92	0
-90.6	0	-87.7	0	-88.7	0
-87.3	0	-84.4	0	-85.4	0
-84	0	-81.1	0	-82.1	0
-80.7	0	-77.8	0	-78.8	0
-77.5	0	-74.5	0	-75.5	0
-74.2	0	-71.2	0	-72.2	0
-70.9	0	-67.9	0	-68.9	0
-67.6	0	-64.6	0	-65.7	0
-64.3	0	-61.3	0	-62.4	0
-61	0	-58	0	-59.1	0

-57.7	0	-54.7	0	-55.8	0
-54.4	0	-51.5	0	-52.5	0
-51.1	0	-48.2	0	-49.2	0
-47.8	0	-44.9	0	-45.9	0
-44.6	0	-41.6	0	-42.6	0
-41.3	0	-38.3	0	-39.3	0
-38	0	-35	0	-36	0
-34.7	0	-31.7	0	-32.7	0
-31.4	0	-28.4	0	-29.4	0
-28.1	0	-25.1	0	-26.2	0
-24.8	0	-21.8	0	-22.9	0
-21.5	0	-18.5	0	-19.6	0
-18.2	2171.64	-15.2	720.185	-16.3	0
-14.9	9516.282	-12	6631.806	-13	3443.197
-11.7	22703.777	-8.66	35682.719	-9.7	16905.791
-8.36	45698.383	-5.37	80484.594	-6.4	50261.223
-5.07	61980.938	-2.08	86358.352	-3.11	87833.531
-1.78	54865.652	1.21	59168.258	0.18	81104.055
1.51	39221.176	4.5	28235.869	3.47	47567.703
4.8	27651.076	7.8	7584.078	6.76	19122.189
8.09	17672.295	11.1	255.531	10.1	1276.494
11.4	9298.993	14.4	0	13.3	0
14.7	2698.311	17.7	0	16.6	0
18	0	21	0	19.9	0
21.2	0	24.3	0	23.2	0
24.5	0	27.5	0	26.5	0
27.8	0	30.8	0	29.8	0
31.1	0	34.1	0	33.1	0
34.4	0	37.4	0	36.4	0
37.7	0	40.7	0	39.7	0
41	0	44	0	43	0
44.3	0	47.3	0	46.3	0
47.6	0	50.6	0	49.6	0
50.9	0	53.9	0	52.8	0
54.1	0	57.2	0	56.1	0
57.4	0	60.5	0	59.4	0
60.7	0	63.8	0	62.7	0
64	0	67	0	66	0
67.3	0	70.3	0	69.3	0
70.6	0	73.6	0	72.6	0
73.9	0	76.9	0	75.9	0
77.2	0	80.2	0	79.2	0
80.5	0	83.5	0	82.5	0
83.8	0	86.8	0	85.8	0
87	0	90.1	0	89.1	0
90.3	0	93.4	0	92.4	0
93.6	0	96.7	0	95.6	0
96.9	0	100	0	98.9	0
100	0	103	0	102	0
103	0	107	0	106	0
107	0	110	0	109	0
110	0	113	0	112	0
113	0	116	0	115	0
117	0	120	0	119	0
120	0	123	0	122	0
123	0	126	0	125	0
127	0	130	0	129	0
130	0	133	0	132	0

133	0	136	0	135	0
136	0	139	0	138	0
140	0	143	0	142	0
143	0	146	0	145	0
146	0	149	0	148	0
150	0				

4.A.3. Resistivity (PPAD)

4.A.3.1 PPAD-BIE

Ohm.m	Std D.
66.89707	5.30687

4.A.3.2 PPAD-BIE-2M

Ohm.m	Std D.
134.11082	0.64829

4.A.3.3 PPAD-AIE

Ohm.m	Std D.
30.53628	0.73889

4.A.3.4 PPAD-AIE-2M

Ohm.m	Std D.
32.81519	1.34035

4.A.3.5 PPAD-AIE-12M

Ohm.m	Std D.
220.32492	3.2306

4.A.3.6 PPAD-RAL

Ohm.m	Std D.
16.20685	1.65753

4.A.3.7 PPAD-RAL-12M

Ohm.m	Std D.
21.64683	1.16662

4.A.3.8 PPAD-RAL-EG

Ohm.m	Std D.
0.22959	0.08048

4.A.3.9 PPAD-RAL-EG-12M

Ohm.m	Std D.
0.65596	0.01463

4.A.4. Conductivity (PPAD)

4.A.4.1 PPAD-BIE

Siemens/m	Std D.
0.01501	0.00117

4.A.4.2 PPAD-BIE-2M

Siemens/m	Std D
0.00746	3.60772E-5

4.A.4.3 PPAD-AIE

Siemens/m	Std D
0.03276	7.86107E-4

4.A.4.4 PPAD-AIE-2M

Siemens/m	Std D
0.03051	0.00124

4.A.4.5 PPAD-AIE-12M

Siemens/m	Std D
0.00454	6.69639E-5

4.A.4.6 PPAD-RAL

Siemens/m	Std D
0.06215	0.00656

4.A.4.7 PPAD-RAL-12M

Siemens/m	Std D
0.04629	0.00248

4.A.4.8 PPAD-RAL-EG

Siemens/m	Std D
4.67561	1.37084

4.A.4.9 PPAD-RAL-EG-12M

Siemens/m	Std D
1.52498	0.0338

4.A.5. Resistivity (PPAD-LiTFSI)

4.A.5.1 PPAD-LiTFSI

Ohm.m	Std D.
77.87317	3.29696

4.A.5.2 PPAD-LiTFSI-2M

Ohm.m	Std D.
389.51853	2.11387

4.A.5.3 PPAD-LiTFSI-12M

Ohm.m	Std D.
28613.62589	1603.43147

4.A.5.4 PPAD-LiTFSI-RAL

Ohm.m	Std D.
87.80312	3.69152

4.A.5.5 PPAD-LiTFSI-RAL-12M

Ohm.m	Std D.
112.03422	3.89961

4.A.5.6 PPAD-LiTFSI-RAL-EG

Ohm.m	Std D.
8.00164	0.34448

4.A.5.7 PPAD-LiTFSI-RAL-EG-12M

Ohm.m	Std D.
31.23748	3.47544

4.A.6. Conductivity (PPAD-LiTFSI)

4.A.6.1 PPAD-LiTFSI

Siemens/m	Std D.
0.01286	5.57421E-4

4.A.6.2 PPAD-LiTFSI-2M

Siemens/m	Std D.
0.00257	1.38984E-5

4.A.6.3 PPAD-LiTFSI-12M

Siemens/m	Std D.
3.50237E-5	2.01605E-6

4.A.6.4 PPAD-LiTFSI-RAL

Siemens/m	Std D.
0.0114	4.78757E-4

4.A.6.5 PPAD-LiTFSI-RAL-12M

Siemens/m	Std D.
0.00893	3.0635E-4

4.A.6.6 PPAD-LiTFSI-RAL-EG

Siemens/m	Std D.
0.12513	0.00526

4.A.6.7 PPAD-LiTFSI-RAL-EG-12M

Siemens/m	Std D.

0.03227 0.00341

4.A.7. *In Vitro* Cytocompatibility Analysis

4.A.7.1 L929 MTT

0,450	0,478	0,442	0,401
0,490	0,467	0,482	0,428
0,410	0,389	0,419	0,352

4.A.7.2 L929 LDH

0,283	0,309	0,302	0,346	2,817
0,281	0,322	0,307	0,335	2,987
0,280	0,317	0,307	0,324	2,840

4.A.7.3 SHSY5 MTT

0,402	0,358	0,316
0,400	0,353	0,321
0,390	0,373	0,332

4.A.7.4 SHSY5 LDH

2,164	0,362	0,421
2,353	0,345	0,271
2,256	0,362	0,419

4.A.7.5 SHSY5 ALAMAR

0,031	0,065	0,132	0,300	0,052	0,117	0,151	0,253
0,029	0,081	0,138	0,282	0,052	0,090	0,149	0,240
0,041	0,071	0,128	0,310	0,040	0,100	0,150	0,220

4.B. ESI ANALYSES

4.B.1. FTIR

4.B.1.1 PPAD-BIE

PPAD-BIE-FTIR.CSV

4.B.1.2 PPAD-AIE

PPAD-AIE-FTIR.xlsx

4.B.1.3 PPAD-LiTFSI

PPAD-LiTFSI-FTIR.CSV

4.B.1.4 PDMS

PDMS-FTIR.CSV

4.B.2. Resistance - Before Stretching (PPAD-RAL-EG-PDMS)

4.B.2.1 Channel 1

Ohm	Std D.
826.66667	9.29157

4.B.2.2 Channel 2

Ohm	Std D.
924	6.55744

4.B.2.3 Channel 3

Ohm	Std D.
894.33333	12.2202

4.B.2.4 Channel 4

Ohm	Std D.
866	19.31321

4.B.2.5 Top Channel

Ohm	Std D.
638.33333	18.44813

4.B.3. Resistance - After Stretching (PPAD-RAL-EG-PDMS)

4.B.3.1 Channel 1

Ohm	Std D.
4467	78.63205

4.B.3.2 Channel 2

Ohm	Std D.
2121.66667	54.09559

4.B.3.3 Channel 3

Ohm	Std D.
2852	17.69181

4.B.3.4 Channel 4

Ohm	Std D.
2390	144.64785

4.B.3.5 Top Channel

Ohm	Std D.
2730.33333	187.02228

4.B.4. Resistance - Before Stretching (PPAD-LiTFSI-RAL-EG-PDMS)

4.B.4.1 Channel 1

Ohm	Std D.
1561.66667	157.19521

4.B.4.2 Channel 2

Ohm	Std D.
1340.33333	26.72702

4.B.4.3 Channel 3

Ohm	Std D.
1590.33333	4.72582

4.B.4.4 Channel 4

Ohm	Std D.
1758.33333	631.8705

4.B.4.5 Top Channel

Ohm	Std D.
1653	66.91039

4.B.5. Resistance - After Stretching (PPAD-LiTFSI-RAL-EG-PDMS)

4.B.5.1 Channel 1

Ohm	Std D.
4122.66667	121.96858

4.B.5.2 Channel 2

Ohm	Std D.
1937.66667	106.25127

4.B.5.3 Channel 3

Ohm	Std D.
4536	11.78983

4.B.5.4 Channel 4

Ohm	Std D.
4462.66667	117.2277

4.B.5.5 Top Channel

Ohm	Std D.
2205.66667	20.00833

4.B.6. Degradation (Mass Loss)

Pure PDMS			PPAD-RAL-EG-PDMS			PPAD-LiTFSI-RAL-EG-PDMS		
Day	% Mass Loss	Std. D.	Day	Mass Loss %	Std. D.	Day	Mass Loss %	Std. D.
0	0	--	0	0	--	0	0	--
1	-0.0841	0.00546	1	-0.19268	0.00171	1	1.39027	0.00626
7	-0.84104	0.00524	7	-0.57803	0.00191	7	0.59583	0.00606
14	-0.33642	0.00539	14	-0.77071	0.0017	14	0.99305	0.00621
21	0	0.0052	21	0.28902	0.00165	21	1.39027	0.00636
28	0	0.00518	28	-0.38536	0.00159	28	1.68818	0.00617

4.B.7. pH Change During Degradation

Pure PDMS		PPAD-RAL-EG-PDMS		PPAD-LiTFSI-RAL-EG-PDMS	
Day	pH	Day	pH	Day	pH
0	7.24	0	7.24	0	7.24
1	7.23667	1	7.21667	1	7.22
7	7.19667	7	7.15333	7	7.13667
14	7.14667	14	7.14667	14	7.13333
21	7.14333	21	7.19667	21	7.22333
28	7.11333	28	7.18667	28	7.13333

4.B.8. Swelling

Pure PDMS			PPAD-RAL-EG-PDMS			PPAD-LiTFSI-RAL-EG-PDMS		
Hour	Swelling Rate %	Std. D.	Hour	Swelling Rate %	Std. D.	Day	Swelling Rate %	Std. D.
0	0	0	0	0	0	0	0	0
1	1.54799	0.00365	1	0.89021	0.00163	1	0.80257	0.00176
6	1.70279	0.00386	6	1.78042	0.00142	6	0.5618	0.00167
12	4.48916	0.00519	12	3.33828	0.00122	12	1.52488	0.00174
24	6.19195	0.0051	24	5.04451	0.00165	24	1.84591	0.00174