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APPENDICES

Appendix A Experimental Data

Table A1 UV adsorption of polyHIPE modified surface with Humic acid at 2 bi- layers, 3 bi- layers, 4 bi- layers and 5 bi- layers

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
350	0.773	0.305	0.71	2.055
351	0.194	0.445	-0.23	-0.031
352	-0.173	0.231	-0.23	-0.031
353	0.858	0.38	-0.23	-0.031
354	0.202	0.415	0.303	0.594
355	0.99	0.481	0.34	0.549
356	0.124	0.437	0.457	1.052
357	0.332	0.637	-0.23	1.247
358	0.1	0.247	0.344	0.344
359	0.765	0.305	0.886	-0.031
360	0.181	0.5	1.013	0.557
361	0.072	0.299	0.373	0.589
362	0.212	0.559	0.183	0.691
363	0.112	0.442	0.5	0.453
364	0.567	0.45	-0.23	1.154
365	0.248	0.407	0.72	-0.031
366	0.178	0.372	0.438	0.775
367	-0.173	0.541	-0.23	-0.031
368	0.108	0.354	0.233	0.557
369	0.379	0.766	1.485	-0.031
370	0.213	0.435	0.336	0.505
371	0.322	0.291	0.712	-0.031
372	0.196	0.417	0.456	0.721
373	0.174	0.365	0.604	0.698

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
374	0.255	0.387	0.572	0.553
375	0.348	0.501	0.467	0.701
376	0.125	0.439	0.531	0.583
377	0.435	0.317	-0.23	-0.031
378	0.165	0.307	0.546	0.718
379	0.082	0.46	0.2	0.439
380	0.301	0.323	0.6	0.756
381	0.225	0.442	0.486	0.855
382	0.124	0.444	0.699	1.037
383	0.259	0.388	1.239	1.03
384	0.298	0.444	1.198	0.938
385	0.174	0.338	0.639	0.957
386	0.23	0.464	0.752	0.816
387	0.298	0.461	0.967	1.244
388	0.225	0.399	0.692	0.783
389	0.204	0.429	0.644	0.641
390	0.212	0.489	0.998	1.107
391	0.293	0.338	0.772	0.843
392	0.169	0.389	0.592	0.63
393	0.199	0.393	0.571	0.692
394	0.206	0.39	0.666	0.801
395	0.254	0.324	1.214	1.252
396	0.239	0.38	0.891	0.884
397	0.215	0.4	0.569	0.715
398	0.149	0.429	0.698	0.698
399	0.195	0.429	0.612	0.851
400	0.242	0.431	0.698	0.814
401	0.181	0.369	0.589	0.733
402	0.2	0.399	0.703	0.889
403	0.211	0.405	0.679	0.749
404	0.392	0.738	-0.23	-0.031

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
405	0.299	0.526	1.544	1.279
406	0.193	0.359	0.693	0.738
407	0.198	0.387	0.618	0.691
408	0.207	0.418	0.641	0.743
409	0.197	0.374	0.629	0.738
410	0.213	0.401	0.683	0.763
411	0.193	0.381	0.628	0.734
412	0.197	0.367	0.598	0.69
413	0.199	0.368	0.612	0.753
414	0.223	0.371	0.653	0.764
415	0.217	0.378	0.659	0.763
416	0.21	0.388	0.647	0.769
417	0.2	0.377	0.602	0.752
418	0.185	0.363	0.673	0.763
419	0.226	0.361	0.705	0.805
420	0.211	0.358	0.606	0.75
421	0.211	0.368	0.612	0.713
422	0.215	0.345	0.775	0.805
423	0.192	0.366	0.602	0.729
424	0.222	0.365	0.676	0.802
425	0.203	0.364	0.68	0.751
426	0.189	0.349	0.632	0.753
427	0.198	0.355	0.607	0.718
428	0.199	0.356	0.63	0.745
429	0.186	0.343	0.581	0.713
430	0.182	0.35	0.603	0.735
431	0.181	0.333	0.557	0.689
432	0.179	0.342	0.559	0.698
433	0.181	0.34	0.599	0.717
434	0.176	0.344	0.619	0.73
435	0.463	0.674	-0.23	-0.031

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
436	0.375	0.534	-0.23	-0.031
437	0.209	0.35	0.736	0.826
438	0.176	0.337	0.597	0.71
439	0.174	0.323	0.577	0.675
440	0.16	0.323	0.542	0.68
441	0.175	0.33	0.586	0.691
442	0.167	0.315	0.549	0.702
443	0.156	0.314	0.533	0.657
444	0.166	0.318	0.547	0.675
445	0.164	0.312	0.553	0.661
446	0.168	0.318	0.557	0.665
447	0.162	0.318	0.556	0.656
448	0.161	0.31	0.574	0.67
449	0.157	0.311	0.52	0.668
450	0.157	0.298	0.546	0.67
451	0.159	0.308	0.587	0.682
452	0.161	0.313	0.558	0.657
453	0.163	0.299	0.531	0.647
454	0.157	0.298	0.531	0.656
455	0.16	0.293	0.531	0.648
456	0.161	0.305	0.537	0.638
457	0.151	0.288	0.529	0.645
458	0.158	0.29	0.523	0.637
459	0.159	0.295	0.538	0.636
460	0.149	0.29	0.516	0.629
461	0.154	0.292	0.511	0.628
462	0.155	0.293	0.52	0.635
463	0.156	0.288	0.513	0.623
464	0.153	0.289	0.514	0.629
465	0.15	0.29	0.504	0.619
466	0.156	0.284	0.496	0.617

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
467	0.151	0.281	0.501	0.616
468	0.142	0.281	0.499	0.605
469	0.144	0.285	0.501	0.612
470	0.147	0.273	0.488	0.603
471	0.145	0.281	0.492	0.601
472	0.15	0.28	0.492	0.593
473	0.146	0.272	0.458	0.598
474	0.139	0.271	0.474	0.586
475	0.143	0.271	0.466	0.592
476	0.144	0.271	0.482	0.597
477	0.141	0.269	0.472	0.598
478	0.147	0.27	0.478	0.59
479	0.142	0.27	0.466	0.58
480	0.142	0.272	0.472	0.593
481	0.144	0.263	0.469	0.583
482	0.145	0.264	0.459	0.575
483	0.144	0.262	0.468	0.575
484	0.128	0.266	0.448	0.572
485	0.134	0.258	0.454	0.57
486	0.14	0.267	0.466	0.572
487	0.135	0.258	0.447	0.563
488	0.137	0.257	0.451	0.561
489	0.135	0.256	0.442	0.56
490	0.13	0.258	0.436	0.555
491	0.138	0.256	0.44	0.565
492	0.136	0.25	0.444	0.556
493	0.132	0.251	0.443	0.552
494	0.134	0.251	0.439	0.559
495	0.133	0.245	0.437	0.554
496	0.131	0.245	0.436	0.55
497	0.124	0.245	0.422	0.541

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
498	0.13	0.246	0.421	0.543
499	0.124	0.242	0.424	0.542
500	0.125	0.241	0.431	0.545
501	0.129	0.241	0.425	0.543
502	0.127	0.24	0.416	0.536
503	0.127	0.24	0.416	0.534
504	0.122	0.237	0.419	0.528
505	0.121	0.235	0.416	0.53
506	0.124	0.23	0.41	0.522
507	0.123	0.225	0.413	0.524
508	0.118	0.229	0.411	0.523
509	0.124	0.227	0.408	0.522
510	0.118	0.221	0.401	0.519
511	0.115	0.222	0.4	0.516
512	0.118	0.224	0.396	0.518
513	0.115	0.217	0.39	0.516
514	0.115	0.22	0.389	0.514
515	0.115	0.22	0.389	0.508
516	0.113	0.216	0.387	0.503
517	0.118	0.214	0.386	0.503
518	0.113	0.217	0.389	0.507
519	0.114	0.213	0.387	0.504
520	0.112	0.214	0.383	0.5
521	0.116	0.211	0.379	0.493
522	0.107	0.208	0.375	0.49
523	0.107	0.207	0.369	0.487
524	0.109	0.209	0.381	0.487
525	0.109	0.206	0.367	0.482
526	0.105	0.202	0.374	0.482
527	0.112	0.201	0.373	0.494
528	0.109	0.204	0.368	0.483

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
529	0.105	0.201	0.371	0.481
530	0.106	0.2	0.361	0.475
531	0.103	0.198	0.358	0.47
532	0.104	0.194	0.36	0.469
533	0.103	0.194	0.358	0.47
534	0.101	0.193	0.355	0.465
535	0.1	0.192	0.355	0.461
536	0.095	0.189	0.35	0.459
537	0.096	0.187	0.346	0.456
538	0.098	0.189	0.345	0.457
539	0.098	0.187	0.345	0.456
540	0.097	0.182	0.341	0.451
541	0.094	0.18	0.338	0.448
542	0.091	0.179	0.335	0.445
543	0.091	0.18	0.334	0.444
544	0.095	0.178	0.34	0.446
545	0.112	0.202	0.387	0.485
546	0.125	0.208	0.414	0.509
547	0.097	0.182	0.345	0.449
548	0.091	0.175	0.33	0.438
549	0.089	0.174	0.323	0.435
550	0.089	0.175	0.324	0.431
551	0.089	0.17	0.324	0.427
552	0.089	0.169	0.319	0.428
553	0.086	0.17	0.319	0.424
554	0.09	0.168	0.321	0.428
555	0.091	0.167	0.316	0.423
556	0.086	0.165	0.319	0.425
557	0.087	0.166	0.314	0.417
558	0.085	0.165	0.311	0.415
559	0.082	0.163	0.312	0.411

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
560	0.085	0.164	0.307	0.408
561	0.087	0.16	0.311	0.413
562	0.084	0.16	0.304	0.407
563	0.087	0.158	0.304	0.412
564	0.082	0.158	0.299	0.407
565	0.083	0.156	0.297	0.4
566	0.084	0.156	0.299	0.396
567	0.081	0.156	0.294	0.4
568	0.08	0.153	0.292	0.399
569	0.076	0.152	0.29	0.395
570	0.081	0.15	0.288	0.393
571	0.08	0.151	0.292	0.39
572	0.076	0.146	0.288	0.389
573	0.072	0.146	0.286	0.386
574	0.074	0.145	0.28	0.38
575	0.075	0.143	0.278	0.382
576	0.076	0.146	0.28	0.382
577	0.078	0.143	0.279	0.382
578	0.075	0.142	0.278	0.375
579	0.076	0.14	0.277	0.373
580	0.071	0.139	0.274	0.367
581	0.071	0.135	0.265	0.368
582	0.071	0.132	0.266	0.367
583	0.067	0.136	0.262	0.364
584	0.067	0.132	0.262	0.357
585	0.066	0.13	0.256	0.354
586	0.065	0.127	0.256	0.352
587	0.065	0.129	0.254	0.35
588	0.061	0.126	0.249	0.346
589	0.062	0.125	0.246	0.346
590	0.061	0.125	0.247	0.342

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
591	0.062	0.121	0.243	0.341
592	0.059	0.12	0.244	0.336
593	0.06	0.119	0.241	0.338
594	0.055	0.118	0.23	0.329
595	0.056	0.117	0.235	0.329
596	0.056	0.119	0.233	0.331
597	0.054	0.113	0.228	0.326
598	0.053	0.116	0.23	0.322
599	0.055	0.117	0.225	0.32
600	0.056	0.114	0.227	0.32
601	0.052	0.111	0.226	0.317
602	0.053	0.112	0.225	0.315
603	0.053	0.108	0.221	0.312
604	0.051	0.112	0.221	0.308
605	0.054	0.11	0.217	0.312
606	0.051	0.109	0.218	0.31
607	0.055	0.109	0.222	0.311
608	0.053	0.107	0.216	0.309
609	0.055	0.107	0.217	0.306
610	0.051	0.107	0.214	0.305
611	0.054	0.105	0.213	0.302
612	0.051	0.106	0.212	0.297
613	0.05	0.104	0.21	0.294
614	0.051	0.103	0.209	0.294
615	0.053	0.103	0.204	0.292
616	0.054	0.102	0.208	0.292
617	0.048	0.101	0.203	0.289
618	0.049	0.098	0.201	0.286
619	0.047	0.1	0.198	0.288
620	0.046	0.099	0.198	0.282
621	0.048	0.098	0.199	0.283

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
622	0.049	0.094	0.197	0.279
623	0.046	0.096	0.193	0.278
624	0.049	0.096	0.188	0.276
625	0.045	0.093	0.19	0.273
626	0.043	0.092	0.187	0.272
627	0.044	0.091	0.188	0.271
628	0.044	0.089	0.184	0.268
629	0.042	0.09	0.183	0.267
630	0.045	0.091	0.184	0.267
631	0.043	0.087	0.18	0.26
632	0.042	0.087	0.18	0.257
633	0.043	0.088	0.178	0.256
634	0.042	0.084	0.175	0.256
635	0.039	0.085	0.171	0.253
636	0.039	0.083	0.172	0.252
637	0.037	0.084	0.172	0.25
638	0.037	0.08	0.166	0.245
639	0.036	0.08	0.163	0.245
640	0.036	0.079	0.164	0.242
641	0.035	0.081	0.16	0.242
642	0.034	0.079	0.159	0.237
643	0.032	0.076	0.158	0.235
644	0.033	0.075	0.159	0.232
645	0.033	0.076	0.157	0.231
646	0.034	0.074	0.157	0.23
647	0.033	0.075	0.152	0.228
648	0.03	0.074	0.151	0.224
649	0.031	0.073	0.151	0.225
650	0.03	0.072	0.149	0.225
651	0.029	0.07	0.147	0.219
652	0.031	0.07	0.145	0.22

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
653	0.029	0.067	0.147	0.22
654	0.027	0.068	0.142	0.214
655	0.032	0.066	0.142	0.214
656	0.027	0.067	0.139	0.209
657	0.027	0.068	0.14	0.211
658	0.029	0.068	0.137	0.209
659	0.028	0.066	0.139	0.208
660	0.03	0.063	0.142	0.21
661	0.025	0.067	0.133	0.203
662	0.028	0.065	0.134	0.201
663	0.028	0.064	0.132	0.202
664	0.026	0.064	0.134	0.199
665	0.027	0.065	0.13	0.198
666	0.03	0.063	0.133	0.197
667	0.026	0.063	0.127	0.194
668	0.03	0.064	0.13	0.196
669	0.027	0.061	0.13	0.195
670	0.026	0.059	0.127	0.191
671	0.028	0.06	0.123	0.191
672	0.029	0.059	0.127	0.192
673	0.029	0.057	0.123	0.186
674	0.025	0.06	0.123	0.185
675	0.027	0.057	0.121	0.185
676	0.024	0.058	0.119	0.178
677	0.028	0.06	0.12	0.183
678	0.027	0.06	0.12	0.179
679	0.027	0.053	0.118	0.18
680	0.027	0.055	0.118	0.175
681	0.026	0.054	0.116	0.176
682	0.027	0.057	0.115	0.175
683	0.025	0.054	0.115	0.172

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
684	0.025	0.055	0.11	0.169
685	0.025	0.054	0.11	0.166
686	0.026	0.053	0.113	0.169
687	0.022	0.051	0.11	0.168
688	0.024	0.053	0.11	0.166
689	0.025	0.052	0.105	0.163
690	0.023	0.055	0.104	0.162
691	0.023	0.049	0.103	0.163
692	0.026	0.05	0.104	0.16
693	0.023	0.049	0.105	0.154
694	0.022	0.047	0.099	0.152
695	0.02	0.049	0.098	0.152
696	0.022	0.045	0.098	0.151
697	0.024	0.044	0.1	0.152
698	0.02	0.047	0.096	0.146
699	0.023	0.045	0.094	0.147
700	0.021	0.044	0.094	0.146
701	0.02	0.045	0.095	0.147
702	0.019	0.044	0.093	0.144
703	0.022	0.043	0.091	0.144
704	0.021	0.045	0.09	0.137
705	0.018	0.043	0.09	0.138
706	0.016	0.041	0.088	0.135
707	0.016	0.041	0.089	0.135
708	0.018	0.04	0.083	0.134
709	0.015	0.041	0.086	0.132
710	0.016	0.041	0.083	0.13
711	0.016	0.042	0.083	0.128
712	0.016	0.038	0.079	0.127
713	0.015	0.039	0.082	0.127
714	0.015	0.039	0.081	0.125

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
715	0.015	0.038	0.079	0.124
716	0.015	0.037	0.078	0.122
717	0.014	0.036	0.076	0.122
718	0.017	0.037	0.074	0.12
719	0.016	0.037	0.076	0.12
720	0.017	0.035	0.078	0.118
721	0.017	0.039	0.076	0.119
722	0.013	0.035	0.071	0.115
723	0.017	0.033	0.072	0.117
724	0.014	0.034	0.071	0.114
725	0.014	0.034	0.071	0.113
726	0.015	0.036	0.072	0.109
727	0.013	0.035	0.07	0.106
728	0.014	0.035	0.069	0.108
729	0.015	0.035	0.071	0.108
730	0.015	0.036	0.072	0.107
731	0.015	0.031	0.072	0.107
732	0.011	0.03	0.066	0.101
733	0.013	0.03	0.065	0.104
734	0.014	0.03	0.067	0.103
735	0.014	0.033	0.066	0.1
736	0.014	0.033	0.066	0.101
737	0.014	0.031	0.065	0.099
738	0.013	0.033	0.066	0.098
739	0.015	0.034	0.059	0.097
740	0.014	0.032	0.061	0.097
741	0.015	0.03	0.062	0.093
742	0.013	0.028	0.059	0.092
743	0.015	0.027	0.063	0.091
744	0.014	0.029	0.059	0.092
745	0.014	0.031	0.056	0.087

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
746	0.017	0.028	0.063	0.086
747	0.014	0.03	0.062	0.091
748	0.014	0.027	0.061	0.089
749	0.013	0.03	0.059	0.089
750	0.019	0.026	0.06	0.087
751	0.01	0.028	0.052	0.081
752	0.016	0.025	0.057	0.083
753	0.014	0.023	0.051	0.081
754	0.01	0.027	0.05	0.081
755	0.015	0.027	0.053	0.082
756	0.014	0.028	0.052	0.079
757	0.014	0.023	0.053	0.08
758	0.012	0.027	0.048	0.076
759	0.011	0.025	0.051	0.077
760	0.011	0.024	0.05	0.073
761	0.011	0.022	0.047	0.077
762	0.014	0.023	0.048	0.076
763	0.014	0.027	0.051	0.073
764	0.012	0.022	0.047	0.072
765	0.013	0.025	0.05	0.074
766	0.011	0.023	0.048	0.075
767	0.014	0.02	0.045	0.071
768	0.013	0.025	0.047	0.07
769	0.013	0.023	0.047	0.072
770	0.011	0.019	0.043	0.064
771	0.008	0.019	0.044	0.065
772	0.01	0.02	0.042	0.064
773	0.01	0.02	0.044	0.065
774	0.01	0.021	0.041	0.06
775	0.009	0.02	0.037	0.059
776	0.012	0.025	0.04	0.061

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
777	0.011	0.017	0.044	0.065
778	0.008	0.019	0.038	0.06
779	0.012	0.02	0.043	0.063
780	0.008	0.019	0.039	0.059
781	0.007	0.016	0.039	0.061
782	0.01	0.016	0.037	0.059
783	0.011	0.019	0.036	0.058
784	0.006	0.014	0.034	0.054
785	0.005	0.018	0.033	0.055
786	0.012	0.015	0.035	0.054
787	0.007	0.016	0.032	0.053
788	0.014	0.015	0.038	0.052
789	0.006	0.016	0.03	0.048
790	0.006	0.014	0.032	0.051
791	0.01	0.015	0.027	0.047
792	0.006	0.013	0.027	0.048
793	0.008	0.013	0.03	0.051
794	0.007	0.013	0.028	0.047
795	0.006	0.019	0.029	0.045
796	0.004	0.015	0.029	0.047
797	0.01	0.014	0.028	0.049
798	0.004	0.013	0.03	0.042
799	0.005	0.017	0.024	0.044
800	0.004	0.013	0.027	0.042
801	0.005	0.012	0.025	0.04
802	0.009	0.015	0.028	0.042
803	0.009	0.012	0.026	0.043
804	0.011	0.012	0.029	0.043
805	0.004	0.015	0.023	0.041
806	0.008	0.013	0.026	0.041
807	0.007	0.016	0.021	0.04

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
808	0.001	0.013	0.023	0.037
809	0.004	0.012	0.024	0.037
810	0.004	0.009	0.023	0.035
811	0.007	0.011	0.028	0.037
812	0.007	0.01	0.024	0.035
813	0.002	0.016	0.024	0.034
814	0.002	0.009	0.018	0.033
815	0.007	0.007	0.022	0.033
816	0.008	0.008	0.026	0.037
817	0.001	0.011	0.02	0.031
818	0.007	0.011	0.02	0.034
819	0.005	0.009	0.022	0.034
820	0.009	0.011	0.025	0.034
821	0.009	0.008	0.02	0.034
822	0.003	0.01	0.018	0.032
823	0.005	0.009	0.017	0.029
824	0.004	0.007	0.016	0.03
825	-0.001	0.009	0.019	0.025
826	0.004	0.012	0.016	0.03
827	0.004	0.01	0.019	0.027
828	0.001	0.012	0.012	0.022
829	0.003	0.007	0.015	0.023
830	0.004	0.009	0.018	0.027
831	0.01	0.007	0.019	0.033
832	0.004	0.007	0.015	0.028
833	0.007	0.009	0.022	0.031
834	0.007	0.006	0.02	0.025
835	0.006	0.007	0.02	0.028
836	0.006	0.008	0.014	0.025
837	0.003	0.005	0.014	0.023
838	0.006	0.009	0.015	0.022

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
839	0.006	0.008	0.012	0.024
840	0.008	0.009	0.019	0.024
841	0.005	0.009	0.016	0.023
842	0.009	0.004	0.018	0.021
843	-0.001	0.006	0.01	0.017
844	0.002	0.012	0.011	0.015
845	0.003	0.007	0.017	0.021
846	0.005	0.006	0.008	0.023
847	0.008	0.008	0.023	0.024
848	0.005	0.007	0.014	0.022
849	0.01	0.007	0.011	0.022
850	0.001	0.01	0.013	0.018
851	0.006	0.003	0.008	0.022
852	0.006	0.003	0.011	0.014
853	0.005	0.009	0.008	0.021
854	0.004	0.006	0.013	0.016
855	-0.002	0.007	0.01	0.016
856	0.005	0.004	0.011	0.01
857	-0.004	0.003	0.007	0.013
858	0.005	0.005	0.015	0.022
859	0.005	0.006	0.009	0.018
860	0.001	0.004	0.005	0.014
861	0.001	0.001	0.002	0.017
862	0.003	0.003	0.01	0.017
863	0.006	0.01	0.006	0.01
864	-0.001	0.003	0.005	0.013
865	0.001	0.005	0.004	0.01
866	0.003	0.006	0.004	0.017
867	0.007	-0.001	0.009	0.012
868	0.006	0.003	0.001	0.013
869	-0.001	0.004	0.003	0.011

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
870	-0.001	0.01	0.009	0.015
871	-0.003	0.014	0.011	0.011
872	0.002	0.009	0.004	0.009
873	0.003	0.005	-0.002	0.01
874	-0.002	0.004	0.004	0.014
875	0.005	0.013	0.003	0.008
876	0.009	0.008	0.003	0.015
877	0.005	0.008	0.009	0.012
878	0.007	0.005	0.006	0.008
879	0.004	0.004	0.006	0.012
880	0.007	0.002	0.009	0.012
881	0.006	0.004	0.003	0.013
882	0.001	0.001	-0.004	0.005
883	0.006	0.003	0.002	0.01
884	0.007	-0.006	0.006	0.013
885	0.003	0.005	0.003	0.005
886	-0.004	0.002	0.001	0.008
887	0.005	0.001	-0.001	0.001
888	0.006	0.001	0.002	0.01
889	-0.006	0.009	-0.004	0.006
890	-0.002	0.002	0.007	0.007
891	0.001	0	-0.005	0.006
892	0.007	-0.006	-0.001	0.011
893	-0.002	-0.002	-0.002	0.003
894	-0.007	0.002	0.008	0.01
895	-0.008	0.001	0.004	-0.003
896	-0.002	0.003	-0.002	0.006
897	-0.006	0.006	-0.008	0.005
898	-0.004	0.008	-0.006	-0.002
899	-0.01	0.005	-0.007	-0.003
900	0	0	0	0

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
901	0	0.01	-0.005	0.001
902	-0.001	0.011	0.003	0.003
903	-0.006	-0.001	-0.007	0.004
904	-0.003	0.007	-0.002	0.002
905	0.007	0.002	0.01	0.01
906	0.007	0.005	-0.011	0.003
907	0.003	0.005	-0.001	0.008
908	0.004	0.006	0.004	0.007
909	0	-0.001	-0.006	-0.005
910	0.011	0.003	-0.001	0.003
911	-0.007	0	-0.009	-0.002
912	0.009	0.001	0.007	0.009
913	0	0.003	-0.002	0
914	-0.001	0.005	0.003	0.006
915	0.003	0.002	-0.001	0.001
916	0.004	0	0	0.008
917	0	0	0	0.006
918	-0.007	0.002	-0.009	0.001
919	0.004	-0.003	-0.001	0.006
920	-0.013	0.009	-0.013	-0.007
921	0.002	0.001	0.003	-0.003
922	0.006	-0.005	0.001	0.007
923	0.003	0.007	-0.004	0.007
924	-0.003	0.001	-0.01	-0.006
925	-0.005	0.001	-0.005	-0.009
926	-0.004	0.007	-0.009	-0.003
927	0	0.005	-0.013	0.003
928	0.009	0.006	-0.005	-0.004
929	0	0.005	-0.011	-0.003
930	0.004	-0.002	0.001	0.003
931	0.004	0.005	-0.005	0.003

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
932	0.001	-0.001	-0.008	0
933	0.011	0.009	0.004	0.007
934	0.002	-0.001	-0.003	-0.01
935	-0.008	0.001	-0.003	-0.002
936	0.012	-0.005	0.013	-0.003
937	0.005	-0.016	-0.011	-0.011
938	0.007	0.005	0.008	-0.002
939	0.011	0	0.007	-0.004
940	0.005	-0.006	0.004	0.004
941	0.02	0.004	0.016	0.005
942	0.007	-0.009	0.02	0.001
943	0.012	0	0.015	0.004
944	0.017	0.017	0.004	-0.011
945	0.024	0.012	0.043	0.013
946	0.016	0.001	0.031	0.008
947	0.04	0.006	0.043	0.017
948	0.009	-0.009	0.008	-0.001
949	0.003	-0.005	-0.01	-0.013
950	-0.001	0.008	0.023	-0.01
951	-0.007	-0.002	-0.002	0.005
952	0.017	0.011	0.034	-0.006
953	0.004	-0.001	0.005	0.004
954	0.013	-0.011	0.026	-0.002
955	0.006	-0.002	-0.006	-0.017
956	0.028	0	0.036	0.008
957	0.025	-0.006	0.03	0.007
958	0.03	-0.006	-0.003	0.001
959	0.011	-0.003	0.008	-0.004
960	0.017	0.001	0.007	-0.011
961	0.028	0.009	0.026	-0.004
962	0.032	-0.01	0.022	-0.015

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
963	0.024	-0.012	0.023	-0.006
964	0.034	-0.008	0.022	0.01
965	0.029	0.001	0.027	-0.006
966	0.021	0.009	0.012	0.008
967	0.03	0	0.014	0.007
968	0.037	-0.003	0.035	-0.003
969	0.025	0.011	0.02	-0.009
970	0.023	0.003	-0.004	-0.008
971	0.013	0.007	-0.012	-0.012
972	0.018	-0.023	0.014	-0.007
973	0.02	-0.007	0.026	-0.013
974	0.01	-0.005	0.008	-0.005
975	0.03	-0.003	0.02	-0.006
976	0.047	0.003	0.045	0.007
977	0.004	0.009	0.01	-0.002
978	0.028	0.012	0.002	-0.02
979	0.041	-0.014	0.018	0.012
980	0.028	-0.012	0.021	-0.006
981	0.045	-0.005	0.027	-0.002
982	0.026	-0.004	0.013	-0.008
983	0.014	-0.004	0.008	-0.005
984	0.033	-0.008	0.046	0.009
985	0.025	-0.015	-0.001	-0.02
986	0.028	0.007	0.02	0.001
987	0.041	0.003	0.007	-0.001
988	0.02	0.009	0.009	-0.011
989	-0.001	-0.004	0.003	-0.013
990	0.018	0.001	0.011	-0.011
991	0.048	0.006	0.049	0.015
992	0.003	-0.012	-0.009	0.003
993	0.028	-0.013	-0.004	0.005

Wavelength (nm)	UV Absorbance			
	2 bi- layers	3 bi- layers	4 bi-layers	5 bi-layers
994	0.04	-0.002	0.052	0.009
995	0.048	-0.016	0.027	0.011
996	0.028	0.006	0.001	0.006
997	0.036	-0.016	0.03	-0.002
998	0.023	0.008	0.019	-0.002
999	0.001	0.011	0.014	0.004
1000	0.01	-0.003	0.019	-0.015

Table A2 Compressive stress of poly(S/DVB) polyHIPE

Batch Reference	Sample Reference	Speed (mm/min)	Maximum Load (N)	Stiffness (N/m)	Young's Modulus (kPa)
S/DVB	1	1.27	283.013	114153.8	5722.249
S/DVB	2	1.27	174.7155	134914	6762.907
S/DVB	3	1.27	172.5276	111706.6	5599.575
S/DVB	4	1.27	174.9868	116105	5820.058
S/DVB	5	1.27	183.7661	141133.7	7074.686
S/DVB	6	1.27	172.34	140186.3	7027.194
Mean			193.5582	126366.6	6334.445
STD.			44.02382	13794.77	691.4981

Table A3 Compressive stress of poly(S/EDDMA) polyHIPE

Batch Reference	Sample Reference	Speed (mm/min)	Maximum Load (N)	Stiffness (N/m)	Young's Modulus (kPa)
S/EGDMA	1	1.27	147.0257	81915.7	4106.233
S/EGDMA	2	1.27	142.4229	64540.98	3235.281
S/EGDMA	3	1.27	145.8925	68131.26	3415.253
S/EGDMA	4	1.27	137.3973	49429.07	2477.758
S/EGDMA	5	1.27	149.472	58067.57	2910.785
S/EGDMA	6	1.27	147.7588	122123.3	6121.742
Mean			145.0971	74034.65	3711.175
STD.			4.466685	25922.94	1299.453

Table A4 Water absorption capacity of poly(S/DVB) polyHIPE with various coating

Time(min)	Water Absorption Capacity (%)					
	PDAD-PAA		PDAD-PSS		CTS-ALG	
	Mean	STD.	Mean	STD.	Mean	STD.
0	0	0	0	0	0	0
1	468.9312	26.7	141.8327	21.4	194.8113	24.5
2	552.1739	30.2	138.1142	25.6	225.7075	12.8
3	604.7101	12.4	145.6839	18.5	243.6321	15.6
4	623.1884	23.5	187.7822	10.4	256.6824	17.9
5	629.8913	31.5	205.9761	26.8	265.0943	20.6
6	640.7609	27.5	210.757	20.6	275.3145	24.5
7	642.5725	25.4	224.834	29.5	283.2547	36.7
8	649.1848	18.7	238.5126	18.4	295.7547	30
9	648.8225	12.7	244.0903	14.5	301.2579	15.6
10	654.4384	14	254.5817	12.3	303.7736	14.5
15	658.2428	14.6	270.6507	14.4	317.0597	13.7
20	661.0507	27.8	274.3692	15.8	323.7421	24.5
25	666.0326	15.6	275.9628	27.8	330.3459	13.7
30	667.1196	24.8	288.1806	30.4	336.6352	27.6
40	669.4746	27.8	296.2815	32.2	344.7327	28.9
50	671.558	30.1	294.6879	12.5	358.0975	21.4
60	672.9167	25.7	307.7025	45.6	364.6226	14.7
120	674.1848	12.7	313.9442	24.5	383.805	26.7
180	675.8152	13.8	318.4595	28.7	392.1384	14.5
360	684.8732	14.5	355.6441	32.2	420.4403	25.6
1080	790.2174	25.6	507.9681	34.6	509.9057	29.6

Table A5 Water absorption capacity of poly(S/DVB) and poly(S/EGDMA) polyHIPE with PDAD-PAA coating

Time (min)	Water Absorption Capacity (%)							
	DVB No		DVB 14		EGDMA No		EGDMA 14	
	Mean	STD.	Mean	STD.	Mean	STD.	Mean	STD.
0	0	0	0	0	0	0	0	0
1	0.1017	25.7	4.6893	26.7	0.1344	21.3	0.7889	23.7
2	0.1495	23	5.5217	30.2	0.1980	30.4	1.2458	35.2
3	0.1627	26.1	6.0471	12.4	0.2124	12.8	1.6903	12.7
4	0.1627	24	6.2319	23.5	0.2543	24.6	2.7778	12.8
5	0.1711	22.5	6.2989	31.5	0.2731	23.1	3.2708	35.8
6	0.1938	25.6	6.4076	27.5	0.2890	41.1	3.8167	20.9
7	0.1938	24.5	6.4257	25.4	0.3092	27.7	4.2486	16.7
8	0.2010	14	6.4918	18.7	0.3410	12.4	4.5444	30.2
9	0.2033	12.5	6.4882	12.7	0.3512	15.6	4.8792	12.6
10	0.2129	17.8	6.5444	14	0.3974	15.6	5.3403	14
15	0.3014	26.7	6.5824	14.6	0.4610	24.6	5.5444	18.4
20	0.3182	22.6	6.6105	27.8	0.4870	28.7	5.7472	19
25	0.3206	12.7	6.6603	15.6	0.4884	19.2	5.9819	23.5
30	0.3361	28.1	6.6712	24.8	0.5072	29.1	6.2125	10.9
40	0.3409	14.6	6.6947	27.8	0.5246	42.3	6.3792	42.7
50	0.3553	11.8	6.7156	30.1	0.5289	16.5	6.6181	26.7
60	0.3672	26.7	6.7292	25.7	0.5361	15.6	6.7056	21.5
120	0.3840	23.8	6.7418	12.7	0.5592	23.6	6.8375	42.6
180	0.3959	14.6	6.7582	13.8	0.6590	14.8	7.0042	13.5
360	0.4270	14.6	6.8487	14.5	0.8208	26.9	7.3681	28.3
1080	0.5215	44.5	7.9022	25.6	2.1142	34.2	8.8931	24.1

Table A6 Contact angle of poly(S/DVB) polyHIPE with PDAD-PSS coating

Sample	Contact Angle (degree)				
	1	**2**	**3**	**Mean**	**STD.**
DVB	119.4415	125.8775	119.7675	121.6955	3.6254
1 bi-layer	117.4317	114.6950	119.1789	117.1019	2.2601
2 bi-layer	104.9195	110.3325	111.6525	108.9682	3.5678
3 bi-layer	106.4659	106.2244	104.5205	105.7369	1.0603
4 bi-layer	98.4341	103.8537	99.1609	100.4829	2.9417
5 bi-layer	85.8675	91.9550	90.9100	89.5775	3.2552

CURRICULUM VITAE

Name: Ms. Jitima Preechawong

Date of Birth: October 26, 1986

Nationality: Thai

University Education:

2005–2008 Bachelor Degree of Materials Engineering, Faculty of Engineering, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

Work Experience:

2009-2011	Position:	Process Engineer
	Company name:	Furukawa FITEL (Thailand) Co.,Ltd

Proceedings:

1. Preechawong, J.; Nithitanakul, M.; Dubas, T.D.; Malakul, P.; and Pakeyangkoon, P. (2013, April 23) Enhancement of Hydrophilicity on Hydrophobic PolyHIPE Materials by Layer-by-Layer Technique. Proceedings of The 4th Research Symposium on Petrochemical and Materials Technology and The 19th PPC symposium on Petroleum, Petrochemicals, and Polymers 2013, Bangkok, Thailand.

Presentations:

1. Preechawong, J.; Nithitanakul, M.; Dubas, T.D.; Malakul, P.; and Pakeyangkoon, P. (2013, April 23) Enhancement of Hydrophilicity on Hydrophobic PolyHIPE Materials by Layer-by-Layer Technique. Paper Presentation at The 4th Research Symposium on Petrochemical and Materials Technology and The 19th PPC symposium on Petroleum, Petrochemicals, and Polymers 2013, Bangkok, Thailand.
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