Appendix

Data: Biodegradation of vapor phase benzene, toluene and xylene (BTX) using Compost based modified biofilter medium

Benzene					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.33	0.21	36.50	20.62	7.53
3	0.44	0.22	50.60	27.57	13.95
5	0.50	0.17	65.75	30.81	20.26
7	0.59	0.14	75.40	36.65	27.63
10	0.73	0.16	78.70	45.69	35.96
12	0.78	0.12	84.10	48.66	40.92
14	0.90	0.08	91.50	55.83	51.09
16	0.96	0.09	90.50	59.48	53.83
18	1.13	0.11	90.60	70.10	63.51
21	1.54	0.13	91.30	195.35	178.36
23	1.62	0.14	91.60	204.72	187.52
25	1.65	0.12	92.50	209.45	193.74
27	1.85	0.08	95.60	234.38	224.07
29	1.96	0.06	96.80	248.11	240.17
31	2.16	0.21	90.30	273.45	246.92
33	2.39	0.20	91.60	303.49	277.99
35	2.60	0.28	89.20	329.00	293.46
37	2.61	0.26	90.01	331.00	297.94
39	0.56	0.09	84.10	108.04	90.86
41	0.70	0.09	86.50	136.57	118.14
43	0.91	0.11	87.50	177.60	155.40
44	1.23	0.12	90.50	239.77	216.99
47	1.52	0.14	90.60	296.00	268.18
49	1.87	0.18	90.60	364.50	330.23
51	2.03	0.30	85.20	394.64	336.23
53	2.20	0.36	83.50	428.32	357.65
55	2.45	0.46	81.35	477.36	388.33
57	2.55	0.60	76.40	496.51	379.33

Data: Biodegradation of vapor phase benzene, toluene and xylene (BTX) using Compost based modified biofilter medium

Toluene					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.12	0.08	38.30	7.59	2.91
3	0.18	0.08	54.40	11.41	6.21
5	0.26	0.08	69.44	15.94	11.07
7	0.34	0.07	78.20	20.87	16.32
10	0.39	0.08	80.60	24.32	19.60
12	0.56	0.08	85.30	34.55	29.47
14	0.65	0.08	88.20	40.56	35.77
16	0.80	0.06	92.40	49.66	45.89
18	0.86	0.06	92.50	53.25	49.26
21	1.06	0.07	93.50	133.80	125.10
23	1.12	0.06	94.50	142.36	134.53
25	1.19	0.06	94.80	150.98	143.13
27	1.38	0.04	97.20	175.22	170.31
29	1.59	0.04	97.50	201.69	196.65
31	1.86	0.13	93.10	235.93	219.65
33	2.06	0.16	92.10	261.28	240.64
35	2.19	0.21	90.40	277.75	251.08
37	2.36	0.26	89.15	299.29	266.82
39	0.36	0.05	85.30	69.33	59.14
41	0.46	0.05	88.20	88.79	78.32
43	0.57	0.05	90.40	110.35	99.76
44	0.85	0.06	92.54	165.85	153.48
47	1.16	0.08	93.50	226.41	211.70
49	1.52	0.13	91.30	296.48	270.69
51	1.74	0.27	84.20	337.91	284.52
53	1.86	0.31	83.50	361.23	301.62
55	1.93	0.40	79.30	376.44	298.52
57	2.26	0.57	74.65	439.02	327.73

Data: Biodegradation of vapor phase benzene, toluene and xylene (BTX) using Compost based modified biofilter medium

Xylene					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.06	0.04	33.50	3.42	1.15
3	0.08	0.04	47.60	4.85	2.31
5	0.10	0.04	62.25	6.16	3.83
7	0.16	0.04	72.30	9.75	7.05
10	0.19	0.05	75.40	11.81	8.90
12	0.23	0.04	81.15	14.03	11.38
14	0.25	0.04	83.50	15.61	13.04
16	0.35	0.05	84.50	21.83	18.45
18	0.49	0.06	87.40	30.54	26.69
21	0.69	0.08	88.20	87.86	77.49
23	0.79	0.06	91.90	100.53	92.39
25	0.86	0.06	93.20	108.44	101.07
27	1.10	0.06	94.50	139.42	131.76
29	1.15	0.10	91.50	145.91	133.51
31	1.33	0.15	88.60	168.91	149.65
33	1.46	0.18	87.60	184.50	161.62
35	1.99	0.27	86.40	252.39	218.07
37	2.13	0.32	85.02	270.29	229.80
39	0.18	0.03	81.12	35.24	28.59
41	0.32	0.05	83.55	62.76	52.43
43	0.46	0.07	84.45	89.73	75.77
44	0.60	0.07	88.56	116.74	103.38
47	0.85	0.10	87.61	164.72	144.31
49	1.19	0.16	86.65	231.36	200.47
51	1.30	0.21	83.80	252.12	211.28
53	1.31	0.23	82.33	255.37	210.24
55	1.46	0.33	77.33	284.30	219.85
57	1.94	0.51	73.50	376.66	276.84

Data: Biodegradation of benzene, toluene and xylene (BTX) using Compost based modified biofilter medium

BTX			
Total Inlet Concentration	**Total Inlet Loading**	**Total Elimination Capacity**	**R.E%**
0.51	31.64	11.58	36.61
0.70	43.83	22.47	51.26
0.85	52.91	35.16	66.45
1.08	67.26	51.00	75.82
1.32	81.82	64.46	78.79
1.56	97.23	81.77	84.10
1.80	112.00	99.89	89.19
2.11	130.97	118.16	90.22
2.48	153.90	139.47	90.62
3.29	417.00	380.94	91.35
3.53	447.62	414.45	92.59
3.70	468.87	437.94	93.40
4.33	549.03	526.14	95.83
4.70	595.71	570.33	95.74
5.35	678.28	616.22	90.85
5.91	749.26	680.25	90.79
6.78	859.13	762.61	88.77
7.10	900.59	794.56	88.23
1.09	212.61	178.59	84.00
1.48	288.12	248.88	86.38
1.94	377.68	330.93	87.62
2.68	522.36	473.85	90.71
3.53	687.14	624.19	90.84
4.59	892.33	801.39	89.81
5.06	984.67	832.03	84.50
5.37	1044.91	869.52	83.21
5.85	1138.11	906.70	79.67
6.74	1312.19	983.91	74.98

Data: Biodegradation of methyl ethyl ketone, toluene and xylene (MTX) using Wood charcoal based modified biofilter medium

MEK					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.07	0.05	37.10	4.54	1.68
3	0.08	0.04	45.15	4.97	2.25
5	0.09	0.03	64.05	5.72	3.66
7	0.10	0.03	70.45	6.34	4.47
9	0.18	0.02	89.32	10.94	9.77
12	0.19	0.01	93.33	11.81	11.03
14	0.26	0.02	93.65	16.17	15.14
16	0.51	0.02	95.32	64.65	61.62
18	0.62	0.02	96.35	78.72	75.85
20	0.63	0.04	94.33	79.61	75.09
22	0.66	0.08	87.65	83.66	73.33
24	0.83	0.10	87.46	105.72	92.46
26	1.03	0.15	85.64	130.56	111.81
28	1.31	0.22	83.34	166.06	138.39
30	1.60	0.28	82.26	202.82	166.84
32	1.71	0.34	80.18	216.76	173.80
34	1.81	0.37	79.56	229.44	182.54
36	0.18	0.03	84.63	35.22	29.80
38	0.28	0.01	94.65	54.59	51.66
40	0.32	0.01	95.35	61.63	58.76
42	0.45	0.06	86.55	88.83	76.88
44	0.50	0.07	85.22	98.22	83.70
46	0.59	0.10	83.32	115.43	96.18
48	0.72	0.13	81.20	139.89	113.59
50	0.86	0.20	76.34	168.26	128.45
52	0.99	0.25	75.22	193.70	145.70
54	1.17	0.33	72.11	228.91	165.07
56	1.24	0.37	70.12	242.61	170.12

Data: Biodegradation of methyl ethyl ketone, toluene and xylene (MTX) using Wood charcoal based modified biofilter medium

Toluene					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.26	0.17	35.67	16.17	5.77
3	0.31	0.14	55.65	19.27	10.73
5	0.34	0.09	73.86	21.14	15.61
7	0.37	0.06	84.21	23.01	19.37
9	0.40	0.05	87.66	24.87	21.80
12	0.45	0.03	93.33	27.98	26.11
14	0.49	0.03	94.55	30.47	28.81
16	0.73	0.02	96.83	92.54	89.60
18	0.82	0.02	97.87	103.94	101.73
20	1.00	0.04	96.44	126.76	122.25
22	1.06	0.11	89.59	134.37	120.38
24	1.17	0.14	87.63	148.31	129.96
26	1.55	0.20	86.91	196.73	170.98
28	1.76	0.28	84.33	223.10	188.14
30	1.96	0.32	83.55	248.20	207.37
32	2.24	0.39	82.46	283.94	234.14
34	2.60	0.50	80.65	329.58	265.80
36	0.37	0.05	87.53	72.00	63.02
38	0.43	0.02	95.66	83.68	80.04
40	0.50	0.01	97.36	97.88	95.30
42	0.55	0.06	88.66	107.03	94.89
44	0.69	0.09	87.32	134.27	117.24
46	0.82	0.11	86.23	159.57	137.60
48	1.22	0.16	86.56	237.41	205.50
50	1.91	0.30	84.32	371.68	313.40
52	1.93	0.36	81.23	375.57	305.07
54	1.96	0.39	80.21	381.41	305.93
56	2.04	0.48	76.53	396.97	303.80

Data: Biodegradation of methyl ethyl ketone, toluene and xylene (MTX) using Wood charcoal based modified biofilter medium

Xylene					
Operation Days	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
2	0.05	0.03	32.10	2.92	0.94
3	0.05	0.03	38.87	3.23	1.26
5	0.07	0.03	58.72	4.23	2.48
7	0.10	0.03	71.60	5.97	4.27
9	0.12	0.02	84.62	7.15	6.05
12	0.17	0.01	92.35	10.32	9.53
14	0.21	0.01	93.35	13.06	12.19
16	0.56	0.03	94.21	71.24	67.11
18	0.64	0.03	95.20	81.38	77.47
20	0.72	0.05	93.12	90.63	84.40
22	0.81	0.11	86.62	102.30	88.61
24	0.91	0.12	86.45	115.35	99.72
26	1.13	0.18	84.32	143.24	120.78
28	1.38	0.23	83.01	174.93	145.21
30	1.67	0.32	80.81	211.69	171.07
32	2.07	0.51	75.35	261.76	197.24
34	2.34	0.60	74.23	296.62	220.18
36	0.27	0.04	83.35	51.76	43.14
38	0.36	0.02	93.35	70.05	65.40
40	0.37	0.02	94.32	72.00	67.91
42	0.67	0.10	85.62	130.96	112.13
44	0.88	0.14	84.01	171.24	143.86
46	0.94	0.18	81.29	182.92	148.69
48	1.02	0.19	80.90	198.49	160.58
50	1.24	0.31	75.24	241.30	181.55
52	1.37	0.38	72.12	266.59	192.27
54	1.51	0.44	71.11	293.84	208.95
56	1.71	0.51	70.01	332.76	232.96

Data: Biodegradation of methyl ethyl ketone, toluene and xylene (MTX) using Wood charcoal based modified biofilter medium

MTX			
Inlet Concentration	**Inlet Loading**	**Elimination Capacity**	**R.E%**
0.38	23.63	8.39	35.50
0.44	27.48	14.23	51.78
0.50	31.09	21.76	70.00
0.57	35.32	28.11	79.61
0.69	42.96	37.63	87.58
0.81	50.11	46.67	93.13
0.96	59.69	56.13	94.04
1.80	228.42	218.34	95.59
2.08	264.04	255.05	96.59
2.34	297.00	281.74	94.86
2.53	320.32	282.32	88.13
2.91	369.38	322.15	87.21
3.71	470.54	403.57	85.77
4.45	564.08	471.74	83.63
5.23	662.70	545.27	82.28
6.02	762.46	605.18	79.37
6.75	855.63	668.52	78.13
0.82	158.98	135.97	85.53
1.07	208.32	197.10	94.62
1.19	231.51	221.97	95.88
1.68	326.82	283.90	86.87
2.07	403.73	344.81	85.41
2.35	457.92	382.47	83.52
2.96	575.78	479.67	83.31
4.01	781.23	623.40	79.80
4.29	835.86	643.04	76.93
4.64	904.16	679.94	75.21
4.99	972.34	706.88	72.70

Data: Biodegradation of styrene using compost based modified biofilter medium

Styrene						
Flowrate	**Time**	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
1	3	0.21	0.12	42.86	16.04	6.88
1	6	0.27	0.09	66.67	20.63	13.75
1	9	0.41	0.11	73.17	31.32	22.92
1	12	0.53	0.07	86.79	40.49	35.14
1	15	0.65	0.08	87.69	49.66	43.54
1	18	0.80	0.09	88.75	61.12	54.24
1	21	1.04	0.12	88.46	79.45	70.28
1	24	1.24	0.11	91.13	94.73	86.33
1	27	1.44	0.12	91.67	110.01	100.84
1	30	1.54	0.13	91.56	117.65	107.72
1	33	1.55	0.13	91.61	118.41	108.48
2	36	1.57	0.06	96.18	239.88	230.71
2	39	1.59	0.05	96.86	242.93	235.29
2	42	1.59	0.05	96.86	242.93	235.29
2	45	2.38	0.19	92.02	363.64	334.61
2	48	2.33	0.16	93.13	356.00	331.55
2	51	2.35	0.14	94.04	359.05	337.66
2	54	2.39	0.14	94.14	365.16	343.77
2	57	2.36	0.11	95.34	360.58	343.77
2	60	2.35	0.12	94.89	359.05	340.72
2	63	1.55	0.05	96.77	236.82	229.18
2	66	1.58	0.05	96.84	241.41	233.77
2	69	1.58	0.06	96.20	241.41	232.24
3	72	1.61	0.04	97.52	368.98	359.82
3	75	1.59	0.04	97.48	364.40	355.23
3	78	2.37	0.05	97.89	543.16	531.70
3	81	2.27	0.04	98.24	520.24	511.08
3	84	2.26	0.06	97.35	517.95	504.20
3	87	2.32	0.07	96.98	531.70	515.66
3	90	2.38	0.11	95.38	545.45	520.24
3	93	3.16	0.47	85.13	724.22	616.50
3	96	3.18	0.45	85.85	728.80	625.67
4	99	3.21	0.36	88.79	980.90	870.89
4	102	3.17	0.34	89.27	968.68	864.78

4	105	2.41	0.20	91.70	736.44	675.32
4	108	2.36	0.14	94.07	721.16	678.38
4	111	2.38	0.11	95.38	727.27	693.66
4	114	2.30	0.09	96.09	702.83	675.32
4	117	2.34	0.08	96.58	715.05	690.60
4	120	3.58	0.80	77.65	1093.96	849.50
4	123	3.56	0.72	79.78	1087.85	867.84

Data: Biodegradation of styrene using wood charcoal +compost based modified biofilter medium

Styrene						
Flowrate	**Time**	**Inlet Concentration**	**Outlet Concentration**	**R.E%**	**Inlet Loading**	**Elimination Capacity**
1	3	0.23	0.11	52.17	17.57	9.17
1	5	0.30	0.09	70.00	22.92	16.04
1	7	0.44	0.12	72.73	33.61	24.45
1	9	0.55	0.09	83.64	42.02	35.14
1	11	0.67	0.08	88.06	51.18	45.07
1	13	0.83	0.08	90.36	63.41	57.30
1	15	1.07	0.10	90.65	81.74	74.10
1	17	1.26	0.09	92.86	96.26	89.38
1	19	1.47	0.08	94.56	112.30	106.19
1	21	1.56	0.07	95.51	119.17	113.83
1	23	1.58	0.07	95.57	120.70	115.36
1	25	1.59	0.06	96.23	121.47	116.88
2	27	1.60	0.06	96.25	244.46	235.29
2	29	1.62	0.06	96.30	247.52	238.35
2	31	1.61	0.05	96.89	245.99	238.35
2	33	2.40	0.21	91.25	366.69	334.61
2	35	2.36	0.19	91.95	360.58	331.55
2	37	2.38	0.17	92.86	363.64	337.66
2	39	2.41	0.16	93.36	368.22	343.77
2	41	2.39	0.14	94.14	365.16	343.77
2	43	2.37	0.14	94.09	362.11	340.72
2	45	1.58	0.07	95.57	241.41	230.71
2	47	1.60	0.06	96.25	244.46	235.29
2	49	1.61	0.07	95.65	245.99	235.29
2	51	1.59	0.05	96.86	242.93	235.29
3	53	1.63	0.05	96.93	373.57	362.11
3	55	1.61	0.06	96.27	368.98	355.23
3	57	2.40	0.08	96.67	550.04	531.70
3	59	2.30	0.07	96.96	527.12	511.08
3	61	2.28	0.06	97.37	522.54	508.79
3	63	2.35	0.10	95.74	538.58	515.66
3	65	2.40	0.13	94.58	550.04	520.24
3	67	3.19	0.50	84.33	731.09	616.50

3	69	3.20	0.47	85.31	733.38	625.67
3	71	3.22	0.40	87.58	737.97	646.29
4	73	3.24	0.39	87.96	990.07	870.89
4	75	3.19	0.36	88.71	974.79	864.78
4	77	2.43	0.22	90.95	742.55	675.32
4	79	2.39	0.17	92.89	730.33	678.38
4	81	2.41	0.14	94.19	736.44	693.66
4	83	2.32	0.11	95.26	708.94	675.32
4	85	2.37	0.11	95.36	724.22	690.60
4	87	3.60	0.82	77.22	1100.08	849.50
4	89	3.59	0.75	79.11	1097.02	867.84
4	91	3.56	0.77	78.37	1087.85	852.56
2						
2						
2						
2						
2						
2						
2						
3	107	1.62	0.23	85.80	371.28	318.56
3	109	1.60	0.14	91.25	366.69	334.61
3	111	1.59	0.11	93.08	364.40	339.19
3	113	2.41	0.17	92.95	552.33	513.37
3	115	2.39	0.16	93.31	547.75	511.08
3	117	2.42	0.13	94.63	554.62	524.83
3	119	3.19	0.45	85.89	731.09	627.96
3	121	3.16	0.41	87.03	724.22	630.25
3	123	3.22	0.47	85.40	737.97	630.25
3	125	3.29	0.51	84.50	754.01	637.13
3	127	3.25	0.43	86.77	744.84	646.29
3	129	3.24	0.45	86.11	742.55	639.42
3	131	3.21	0.45	85.98	735.68	632.54

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