

Plastic Degradation Script and Results

UV transmittance stats

LDPE (Urban)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(LDPEU\$LDPE.Diff)

	Df	Df.res	F value	Pr(>F)
1 LDPETimeFactorU	5	24	11.464	9.8295e-06 ***

Pairwise contrast

Time	estimate	SE	df	t.ratio	p.value
2 - 4	14.4	3.32	24	4.332	0.0002
2 - 12	9.8	3.32	24	2.948	0.007
2 - 24	12	3.32	24	3.61	0.0014
2 - 32	14.2	3.32	24	4.272	0.0003
2 - 52	24.6	3.32	24	7.4	<.0001
4 - 12	-4.6	3.32	24	-1.384	0.1792
4 - 24	-2.4	3.32	24	-0.722	0.4773
4 - 32	-0.2	3.32	24	-0.06	0.9525
4 - 52	10.2	3.32	24	3.068	0.0053
12 - 24	2.2	3.32	24	0.662	0.5144
12 - 32	4.4	3.32	24	1.324	0.1981
12 - 52	14.8	3.32	24	4.452	0.0002
24 - 32	2.2	3.32	24	0.662	0.5144
24 - 52	12.6	3.32	24	3.79	0.0009
32 - 52	10.4	3.32	24	3.129	0.0046

LDPE (Forested)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(LDPEF\$LDPE.Diff)

	Df	Df.res	F value	Pr(>F)
1 TimeFactorF	5	24	9.2983	4.9983e-05 ***

Pairwise contrast

Time	estimate	SE	df	t.ratio	p.value
2 - 4	10.2	3.57	24	2.856	0.0087
2 - 12	16	3.57	24	4.48	0.0002
2 - 24	10.8	3.57	24	3.024	0.0059
2 - 32	14.8	3.57	24	4.144	0.0004

2 - 52	23.2	3.57	24	6.496	<.0001
4 - 12	5.8	3.57	24	1.624	0.1174
4 - 24	0.6	3.57	24	0.168	0.868
4 - 32	4.6	3.57	24	1.288	0.21
4 - 52	13	3.57	24	3.64	0.0013
12 - 24	-5.2	3.57	24	-1.456	0.1583
12 - 32	-1.2	3.57	24	-0.336	0.7398
12 - 52	7.2	3.57	24	2.016	0.0551
24 - 32	4	3.57	24	1.12	0.2738
24 - 52	12.4	3.57	24	3.472	0.002
32 - 52	8.4	3.57	24	2.352	0.0272

PET (Urban)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PETF\$PET.Diff)

	Df	Df.res	F value	Pr(>F)
1 TimeFactorU	5	24	17.396	2.7165e-07 ***

Pairwise Contrast

Time	estimate	SE	df	t.ratio	p.value
2 - 4	5.2	2.85	24	1.828	0.0801
2 - 12	13.4	2.85	24	4.71	0.0001
2 - 24	17.8	2.85	24	6.256	<.0001
2 - 32	14.4	2.85	24	5.061	<.0001
2 - 52	23	2.85	24	8.084	<.0001
4 - 12	8.2	2.85	24	2.882	0.0082
4 - 24	12.6	2.85	24	4.429	0.0002
4 - 32	9.2	2.85	24	3.234	0.0035
4 - 52	17.8	2.85	24	6.256	<.0001
12 - 24	4.4	2.85	24	1.546	0.1351
12 - 32	1	2.85	24	0.351	0.7283
12 - 52	9.6	2.85	24	3.374	0.0025
24 - 32	-3.4	2.85	24	-1.195	0.2438
24 - 52	5.2	2.85	24	1.828	0.0801
32 - 52	8.6	2.85	24	3.023	0.0059

PET (Forested)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PETF\$PET.Diff)

	Df	Df.res	F value	Pr(>F)
1 TimeFactorF	5	24	10.653	1.7629e-05 ***

Pairwise contrast

Time	estimate	SE	df	t.ratio	p.value
2 - 4	7.6	3.41	24	2.229	0.0355
2 - 12	10.8	3.41	24	3.167	0.0042
2 - 24	19.2	3.41	24	5.63	<.0001
2 - 32	15	3.41	24	4.398	0.0002
2 - 52	21.2	3.41	24	6.217	<.0001
4 - 12	3.2	3.41	24	0.938	0.3574
4 - 24	11.6	3.41	24	3.401	0.0023
4 - 32	7.4	3.41	24	2.17	0.0401
4 - 52	13.6	3.41	24	3.988	0.0005
12 - 24	8.4	3.41	24	2.463	0.0213
12 - 32	4.2	3.41	24	1.232	0.23
12 - 52	10.4	3.41	24	3.05	0.0055
24 - 32	-4.2	3.41	24	-1.232	0.23
24 - 52	2	3.41	24	0.586	0.563
32 - 52	6.2	3.41	24	1.818	0.0816

Polystyrene (Urban)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PSPU\$PSP.Diff)

	Df	Df.res	F value	Pr(>F)
1 TimeFactorU	5	12	251.1	1.0431e-11 ***

Pairwise contrast

Time	estimate	SE	df	t.ratio	p.value
2 - 4	6	0.471	12	12.728	<.0001
2 - 12	3	0.471	12	6.364	<.0001
2 - 24	12	0.471	12	25.456	<.0001
2 - 32	12	0.471	12	25.456	<.0001
2 - 52	12	0.471	12	25.456	<.0001
4 - 12	-3	0.471	12	-6.364	<.0001
4 - 24	6	0.471	12	12.728	<.0001
4 - 32	6	0.471	12	12.728	<.0001
4 - 52	6	0.471	12	12.728	<.0001

12 - 24	9	0.471	12	19.092	<.0001
12 - 32	9	0.471	12	19.092	<.0001
12 - 52	9	0.471	12	19.092	<.0001
24 - 32	0	0.471	12	0	1
24 - 52	0	0.471	12	0	1
32 - 52	0	0.471	12	0	1

Polystyrene (forested)

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PSPF\$PSP.Diff)

Df Df.res F value			Pr(>F)		
1	TimeFactorF	5	12	23.794	7.6746e-06 ***
Time	estimate	SE	df t	.ratio	p.value
2 - 4	3.33	1.43	12	2.33	0.0381
2 - 12	7.17	1.43	12	5.01	0.0003
2 - 24	11.5	1.43	12	8.039	<.0001
2 - 32	11.5	1.43	12	8.039	<.0001
2 - 52	11.5	1.43	12	8.039	<.0001
4 - 12	3.83	1.43	12	2.68	0.02
4 - 24	8.17	1.43	12	5.709	0.0001
4 - 32	8.17	1.43	12	5.709	0.0001
4 - 52	8.17	1.43	12	5.709	0.0001
12 - 24	4.33	1.43	12	3.029	0.0105
12 - 32	4.33	1.43	12	3.029	0.0105
12 - 52	4.33	1.43	12	3.029	0.0105
24 - 32	0	1.43	12	0	1
24 - 52	0	1.43	12	0	1
32 - 52	0	1.43	12	0	1

Polymer changes in weight data across polymers and sites (forested vs urban)

LDPE

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(LDPEW\$Weight)

	Df	Df.res	F value	Pr(>F)
1 LDPEWFactor	1	58	1.5952	0.21164

PET

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PETW\$Weight)

	Df	Df.res	F value	Pr(>F)
1 PETWFactor	1	58	6.9545	0.010713 *

Polystyrene

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(PSPW\$Weight)

	Df	Df.res	F value	Pr(>F)
1 PSPWFactor	1	31	0.2155	0.64573

Fragmentation analysis across time and site

PET

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Particle)

	Df	Df.res	F value	Pr(>F)	
Time	5	47	21.8875	2.97E-11	***
Site	1	47	28.7211	2.47E-06	***
Time: Site	5	47	7.4937	3.07E-05	***

Pairwise contrast

Time	Site	Pairwise estimate	SE	DF	t.ratio	P.value
0 - 2	Forested - Urban	12	10.8	47	1.115	0.2707
0 - 4	Forested - Urban	13.4	10.8	47	1.245	0.2194
0 - 12	Forested - Urban	16.4	10.8	47	1.523	0.1344
0 - 24	Forested - Urban	8.8	11.1	47	0.793	0.4318
0 - 32	Forested - Urban	59.4	10.8	47	5.517	<.0001
2-4	Forested - Urban	1.4	10.8	47	0.13	0.8971
2-12	Forested - Urban	4.4	10.8	47	0.409	0.6846
2-24	Forested - Urban	-3.2	11.1	47	-0.288	0.7743
2-32	Forested - Urban	47.4	10.8	47	4.403	0.0001
4-12	Forested - Urban	3	10.8	47	0.279	0.7817
4-24	Forested - Urban	-4.6	11.1	47	-0.415	0.6804
4-32	Forested - Urban	46	10.8	47	4.273	0.0001
12-24	Forested - Urban	-7.6	11.1	47	-0.685	0.4968
12-32	Forested - Urban	43	10.8	47	3.994	0.0002
24 - 32	Forested - Urban	50.6	11.1	47	4.56	<.0001

LDPE

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Particle)

	Df	Df.res	F value	Pr(>F)
Time	5	41	48.1302	4.2475e-16 ***
Site	1	41	15.871	0.00027147 ***
Time: Site	5	41	8.3513	1.6344e-05 ***

Pairwise contrast

Time	Site	Pairwise estimate	SE	DF	t.ratio	P.value
0 - 2	Forested - Urban	-5.25	11.1	41	-0.472	0.6395
0 - 4	Forested - Urban	17.2	11.1	41	1.546	0.1298
0 - 12	Forested - Urban	40.62	11.4	41	3.549	0.001
0 - 24	Forested - Urban	5.2	11.1	41	0.467	0.6427
0 - 32	Forested - Urban	55.87	11.7	41	4.792	<.0001
2 - 4	Forested - Urban	22.45	11.4	41	1.961	0.0567
2 - 12	Forested - Urban	45.88	11.8	41	3.9	0.0003
2 - 24	Forested - Urban	10.45	11.4	41	0.913	0.3667
2 - 32	Forested - Urban	61.12	12	41	5.107	<.0001
4 - 12	Forested - Urban	23.43	11.8	41	1.992	0.0531
4 - 24	Forested - Urban	-12	11.4	41	-1.048	0.3007
4 - 32	Forested - Urban	38.67	12	41	3.231	0.0024
12 - 24	Forested - Urban	-35.42	11.8	41	-3.012	0.0044
12 - 32	Forested - Urban	15.24	12.3	41	1.243	0.2211
24 - 32	Forested - Urban	50.67	12	41	4.234	0.0001

Polystyrene

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Particle)

	Df	Df.res	F value	Pr(>F)
Time	5	24	4.309	0.00613057 **
Site	1	24	15.6445	0.00058986 ***
Time: Site	5	24	4.4635	0.00512855 **

Pairwise Contrast

Time	Site	Pairwise estimate	SE	DF	t.ratio	P.value
0 - 2	Forested - Urban	0.667	8.57	24	0.078	0.9386
0 - 4	Forested - Urban	7.333	8.57	24	0.856	0.4006

0 - 12	Forested - Urban	14.333	8.57	24	1.673	0.1074
0 - 24	Forested - Urban	24.333	8.57	24	2.839	0.0091
0 - 32	Forested - Urban	31.333	8.57	24	3.656	0.0012
2 - 4	Forested - Urban	6.667	8.57	24	0.778	0.4442
2 - 12	Forested - Urban	13.667	8.57	24	1.595	0.1239
2 - 24	Forested - Urban	23.667	8.57	24	2.762	0.0109
2 - 32	Forested - Urban	30.667	8.57	24	3.578	0.0015
4 - 12	Forested - Urban	7	8.57	24	0.817	0.4221
4 - 24	Forested - Urban	17	8.57	24	1.984	0.0588
4 - 32	Forested - Urban	24	8.57	24	2.8	0.0099
12 - 24	Forested - Urban	10	8.57	24	1.167	0.2547
12 - 32	Forested - Urban	17	8.57	24	1.984	0.0588
24 - 32	Forested - Urban	7	8.57	24	0.817	0.4221

Fragmentation rate data across sites

Polystyrene

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Rate)

	Df	Df.res	F value	Pr(>F)
1 PSSiteF	1	4	13.5	0.021312 *

PET

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Rate)

	Df	Df.res	F value	Pr(>F)
1 PETSiteF	1	8	2.061	0.18904

LDPE

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Rate)

	Df	Df.res	F value	Pr(>F)
1 LDPESiteF	1	7	10.834	0.013274 *

Cellulose

Analysis of Variance of Aligned Rank Transformed Data

Table Type: Anova Table (Type III tests)

Model: No Repeated Measures (lm)

Response: art(Rate)

	Df	Df.res	F value	Pr(>F)
1 CrSiteF	1	2	8	0.10557