

CHAPTER 5

CONCLUSIONS & SUGGESTIONS FOR FUTURE WORK

5.1 Conclusions

1. The particle size and pH of the activated carbon powder and AC dispersion has a significant effect on latex compound stability in terms of Chemical and Mechanical stability. The AC powder should have a particle size below 10 μ on raw material and 3 μ maximum in dispersion form. The pH of raw material and dispersion form should be either neutral or basic. In the preparation of dispersion, only the dispersing agent is required to prepare a homogenous dispersion of activated carbon.
2. Activated carbon can be prepared only up to 36% maximum Total Solids Content to achieve good dispersion properties. The maximum dosage of activated carbon that can be incorporated to NR latex foam pillow is 2.00% (dry).
3. The optimum vulcanizing system for NR latex foam pillow with AC found from this study comprises of sulphur 2.55 phr, ZDC 1.10 phr and ZMBT 0.85 phr to get optimum physical properties.
4. NR latex foam with AC has a higher sorption power compared to standard NR latex foam.



5.2 Suggestions for future work

1. The sorption effect of NR latex foam with AC is higher than that of normal NR latex foam according to the results of this study. It is suggested to further study and investigate the sorption properties using more developed and sophisticated methods.
2. It is suggested that to analyze the cell structure of foam to identify how the activated carbon particles attached to rubber particles within a rubber/ air matrix.
3. It is suggested that to do a detail investigation on bonding mechanism of various known pollutants to activated carbon in latex foam, whether it is similar to sorption mechanisms based on powder or granular form of AC or different.

APPENDIX I

Type		Position									
		1		2		3		4		5	
		Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)
1S	A	2.620	2.515	2.560	2.550	2.525	2.505	2.610	2.490	2.525	2.520
	B	2.460	2.380	2.450	2.420	2.480	2.455	2.490	2.440	2.470	2.400
	C	2.550	2.490	2.570	2.500	2.570	2.525	2.580	2.515	2.580	2.505
	D	2.505	2.405	2.505	2.430	2.500	2.455	2.470	2.420	2.460	2.430
2S	A	2.495	2.450	2.505	2.418	2.510	2.435	2.485	2.445	2.475	2.430
	B	2.370	2.350	2.380	2.330	2.405	2.350	2.410	2.350	2.440	2.350
	C	2.550	2.535	2.570	2.550	2.590	2.515	2.580	2.505	2.570	2.500
	D	2.465	2.395	2.450	2.340	2.420	2.370	2.430	2.405	2.430	2.360
3S	A	2.610	2.505	2.570	2.550	2.535	2.495	2.605	2.495	2.525	2.500
	B	2.480	2.380	2.470	2.420	2.480	2.445	2.490	2.410	2.490	2.410
	C	2.560	2.490	2.575	2.505	2.580	2.515	2.580	2.510	2.570	2.505
	D	2.515	2.415	2.505	2.425	2.505	2.455	2.470	2.425	2.470	2.420



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Appendix i - Initial and final heights at different positions of foam test pieces made of latex compounds 1S, 2S & 3S (For each type, sample size is 4)

APPENDIX II

Type		Position									
		1		2		3		4		5	
		Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)
1D	A	2.500	2.350	2.505	2.380	2.500	2.410	2.520	2.350	2.530	2.430
	B	2.580	2.460	2.500	2.380	2.490	2.330	2.520	2.400	2.540	2.440
	C	2.610	2.490	2.520	2.410	2.560	2.360	2.550	2.380	2.620	2.490
	D	2.500	2.350	2.480	2.360	2.420	2.300	2.400	2.240	2.390	2.240
2D	A	2.450	2.315	2.550	2.410	2.525	2.455	2.600	2.490	2.565	2.510
	B	2.480	2.360	2.490	2.410	2.480	2.410	2.510	2.460	2.490	2.410
	C	2.540	2.470	2.570	2.500	2.545	2.505	2.565	2.495	2.570	2.515
	D	2.505	2.415	2.500	2.430	2.510	2.455	2.480	2.425	2.470	2.430
3D	A	2.595	2.450	2.575	2.430	2.510	2.425	2.485	2.405	2.475	2.410
	B	2.570	2.485	2.540	2.430	2.565	2.450	2.510	2.385	2.545	2.320
	C	2.550	2.435	2.575	2.425	2.590	2.505	2.580	2.495	2.580	2.500
	D	2.495	2.390	2.480	2.360	2.490	2.370	2.485	2.400	2.500	2.360

Appendix ii - Initial and final heights at different positions of foam test pieces made of latex compounds 1D, 2D & 3D (For each type, sample size is 4)

APPENDIX III

Type		Position									
		1		2		3		4		5	
		Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)	Initial Ht. (cm)	Final Ht. (cm)
1M	A	2.495	2.450	2.505	2.418	2.510	2.435	2.485	2.445	2.475	2.430
	B	2.370	2.350	2.380	2.330	2.405	2.350	2.410	2.350	2.440	2.350
	C	2.550	2.535	2.575	2.550	2.590	2.515	2.580	2.505	2.570	2.500
	D	2.465	2.395	2.450	2.340	2.420	2.370	2.430	2.405	2.410	2.360
2M	A	2.620	2.515	2.560	2.550	2.555	2.505	2.610	2.490	2.525	2.520
	B	2.460	2.380	2.450	2.420	2.480	2.455	2.490	2.440	2.470	2.400
	C	2.520	2.460	2.550	2.495	2.570	2.515	2.570	2.510	2.580	2.495
	D	2.505	2.405	2.505	2.430	2.500	2.455	2.470	2.420	2.465	2.435
3M	A	2.495	2.410	2.505	2.418	2.510	2.435	2.485	2.445	2.475	2.430
	B	2.370	2.350	2.380	2.330	2.405	2.350	2.410	2.350	2.440	2.350
	C	2.550	2.535	2.575	2.550	2.590	2.515	2.580	2.505	2.570	2.500
	D	2.465	2.395	2.450	2.340	2.420	2.370	2.430	2.405	2.410	2.360



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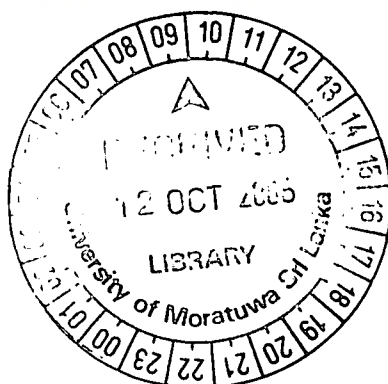
Appendix iii - Initial and final heights at different positions of foam test pieces made of latex compounds 1M, 2M & 3M (For each type, sample size is 4)

APPENDIX IV

Type of compound	Sample ID	Area (mm ²)	Load (kg)	Tensile Strength (kg/mm ²)
1S	1	310.5000	1.628	0.005243156
	2	360.9375	1.875	0.005194805
	3	308.0000	1.584	0.005142857
	4	286.8900	1.521	0.005301684
	5	255.6000	1.234	0.004827856
2S	1	338.5375	1.695	0.005006831
	2	393.4500	2.034	0.005169653
	3	327.7500	1.615	0.004927536
	4	354.2750	1.987	0.005608637
	5	333.4500	1.812	0.005434098
3S	1	334.1675	1.624	0.004859838
	2	334.4000	1.597	0.004775718
	3	373.2400	1.866	0.004999464
	4	365.6200	1.973	0.005396313
	5	352.2300	1.396	0.003963319
	6	369.4950	1.906	0.005158392
1D	1	303.6000	1.312	0.004321476
	2	322.0800	1.210	0.003756831
	3	352.6250	1.781	0.005050691
	4	373.4700	1.845	0.004940156
2D	1	288.1200	1.356	0.004706372
	2	291.0900	1.998	0.006863857
	3	280.1375	1.383	0.004936861
	4	264.7500	1.407	0.005314448
3D	1	334.9500	1.879	0.005609793
	2	343.1025	2.081	0.006065243
	3	323.0000	1.751	0.005421053
	4	365.4000	1.706	0.004668856
	5	332.5000	1.772	0.005329323
1M	1	351.0000	1.524	0.00434188
	2	324.0000	1.458	0.00450000
	3	342.0000	1.642	0.00480117
	4	315.0000	1.714	0.00544127

Type of compound	Sample ID	Area (mm ²)	Load (kg)	Tensile Strength (kg/mm ²)
2M	1	342.0000	1.864	0.005450292
	2	315.0000	1.749	0.005552381
	3	293.2500	1.437	0.004900256
	4	315.0000	1.526	0.004844444
	5	324.0000	1.689	0.005212963
3M	1	333.0000	1.789	0.005372372
	2	297.5000	1.657	0.005569748
	3	351.5000	1.963	0.005584637
	4	328.5000	1.648	0.005016743
	5	310.5000	1.604	0.005165862
C (Control)	1	351.5000	1.987	0.005652916
	2	332.5000	2.105	0.006330827
	3	342.0000	2.016	0.005894737
	4	315.0000	2.354	0.007473016
	5	351.5000	2.224	0.006327169

Appendix iv - Data related to tensile strength test of foam test pieces made by latex compounds 1S - 3S, 1D - 3D, 1M - 3M and C (control)



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