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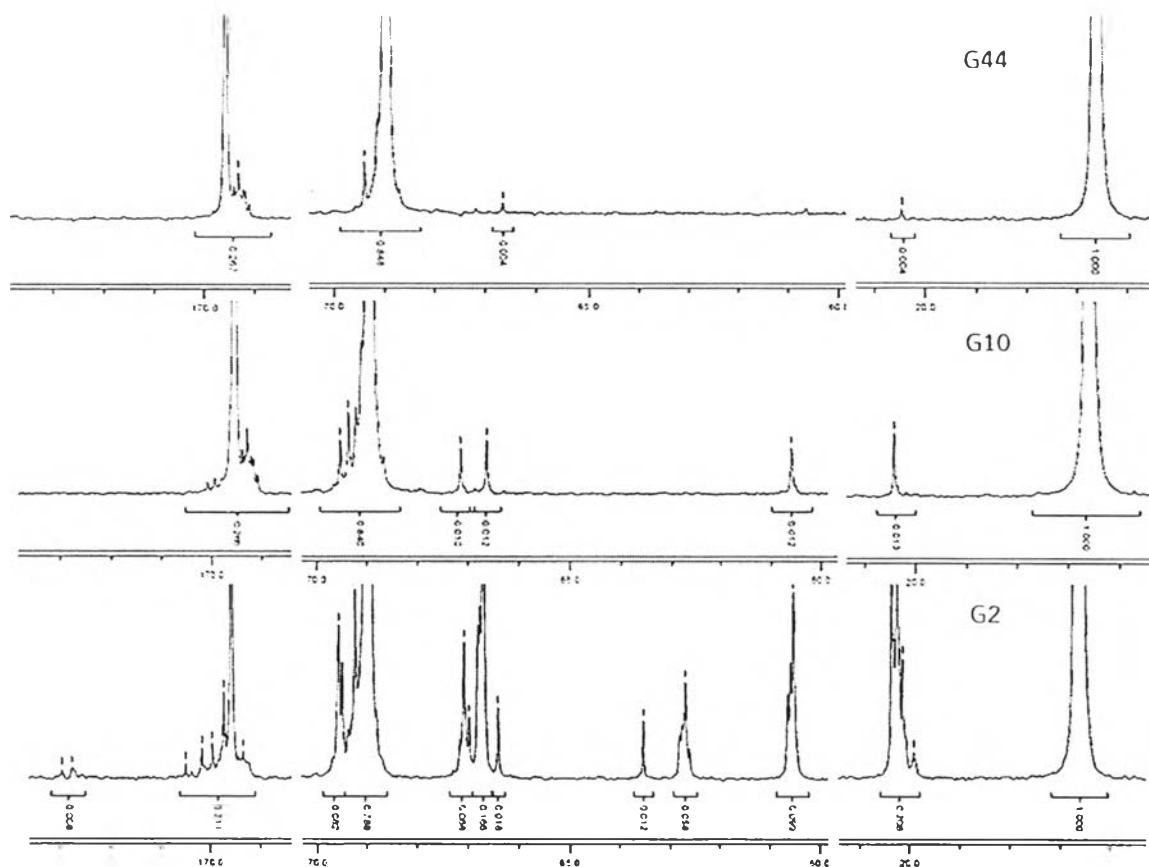


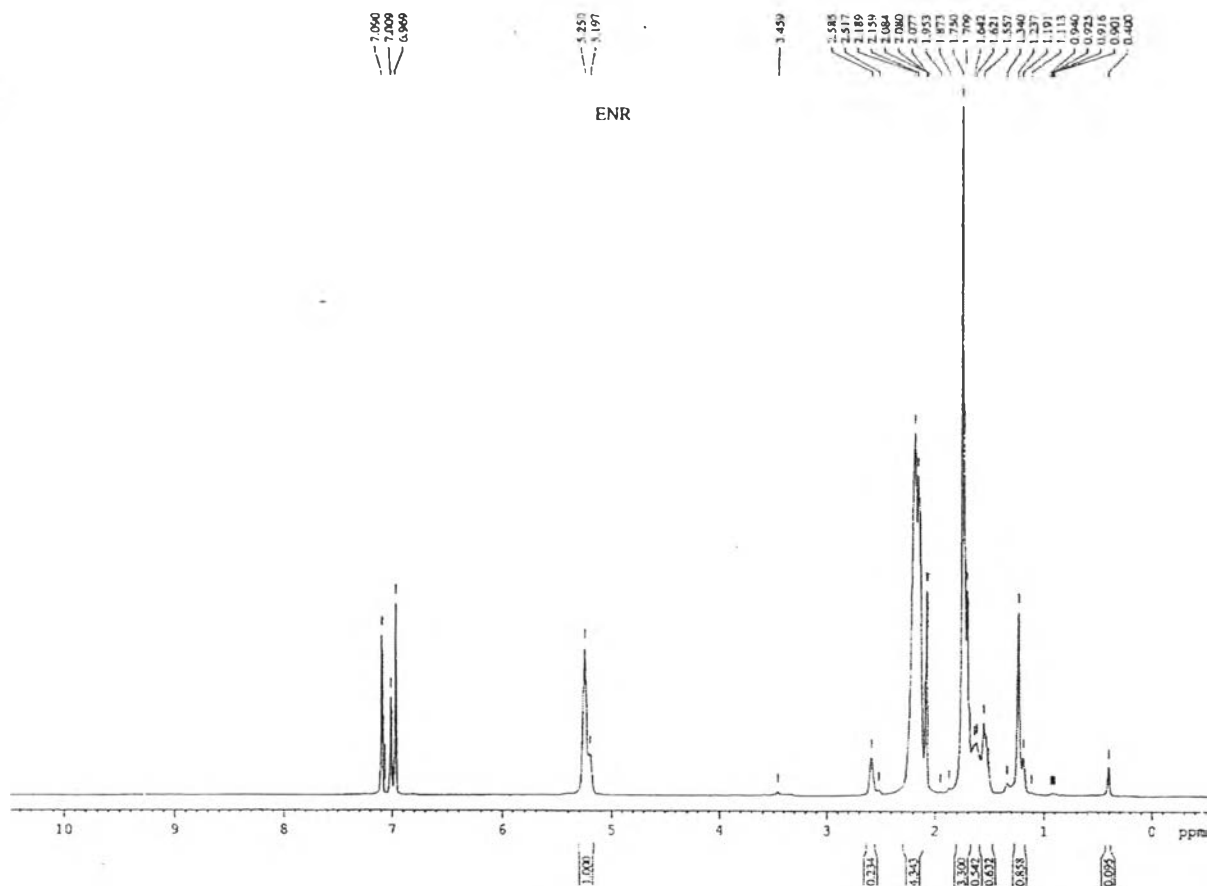
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APPENDIX



Appendix 1: $^1\text{H-NMR}$ spectrum of GPLAs and ENR.1.1 $^1\text{H-NMR}$ spectrum of GPLAsFigure A1. $^1\text{H-NMR}$ spectrum of GPLAs.

1.2. $^1\text{H-NMR}$ and calculation of mole epoxide of ENR.Figure A2. $^1\text{H-NMR}$ spectrum of ENR.

$$\text{Epoxide content (\%)} = \left[\frac{I_{2.7}}{I_{2.7} + I_{5.1}} \right] * 100$$

From figure A2 ;

$$I_{2.7} = 0.234$$

$$I_{5.1} = 1$$

$$\text{Epoxide content (\%)} = 18.96\%$$



Table A1. Calculation of Mole percent of GPLA-cured ENR.

samples	Composition in feed		MW	GPLA				epoxide				
	(wt%)			g	mole	Mole OH	MW	g	mole	mole epoxide	%mole OH	%mole epoxide
	GPLA	ENR										
G ₀ ER11	50	50	2000	2.5	0.00125	0.0025	7200	2.5	0.000347	6.94E-05	97.3	2.7
G ₀ ER12	33	67	2000	1.65	0.000825	0.00165	7200	3.35	0.000465	9.31E-05	94.7	5.3
G ₀ ER14	20	80	2000	1	0.0005	0.001	7200	4	0.000556	0.000111	90.0	10.0
G ₁₀ ER11	50	50	10000	2.5	0.00025	0.0005	7200	2.5	0.000347	6.94E-05	87.8	12.2
G ₁₀ ER12	33	67	10000	1.65	0.000165	0.00033	7200	3.35	0.000465	9.31E-05	78.0	22.0
G ₁₀ ER14	20	80	10000	1	0.0001	0.0002	7200	4	0.000556	0.000111	64.3	35.7
G ₆₀ ER11	50	50	44000	2.5	5.68E-05	0.000114	7200	2.5	0.000347	6.94E-05	62.1	37.9
G ₆₀ ER12	33	67	44000	1.65	3.75E-05	0.000075	7200	3.35	0.000465	9.31E-05	44.6	55.4
G ₆₀ ER14	20	80	44000	1	2.27E-05	4.55E-05	7200	4	0.000556	0.000111	29.0	71.0
Uncured ENR	0	100		0			7200	5	0.000694	0.000139	0.0	100.0

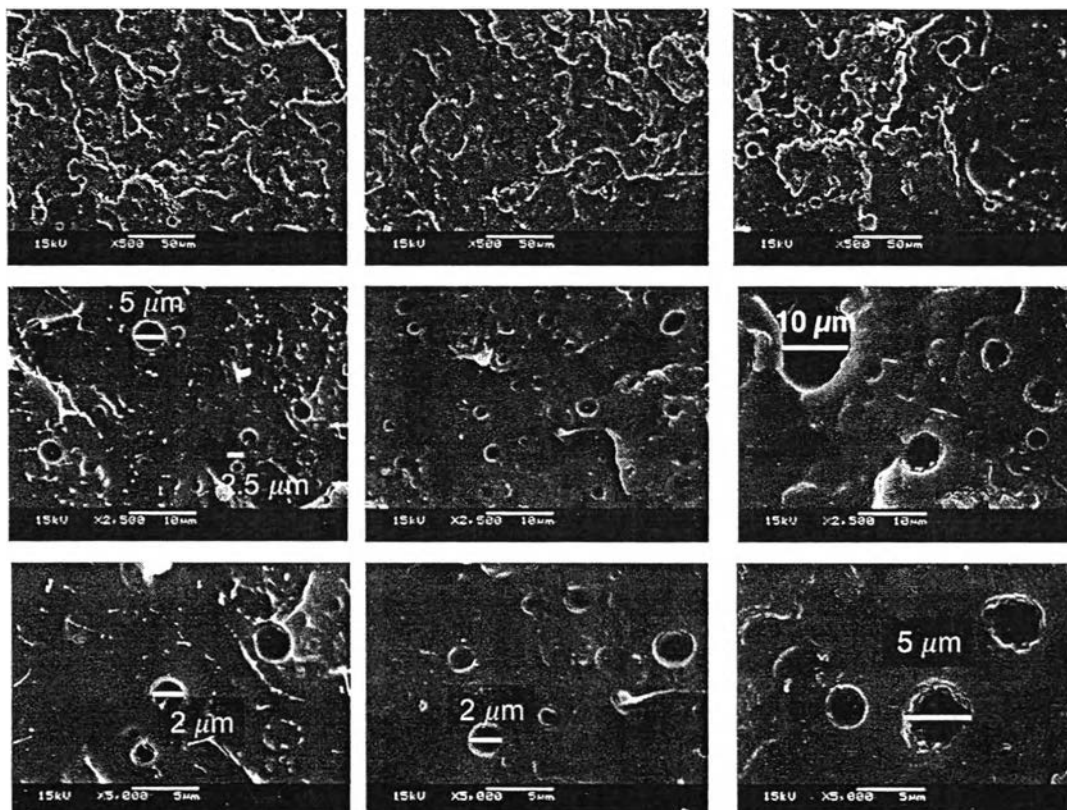
Appendix 3: SEM micrograph of the ENR/PLA blends at different content and type of ENR.

3.1. SEM micrograph of using uncured ENR as toughening agent for PLA

5%wt uncured ENR/PLA

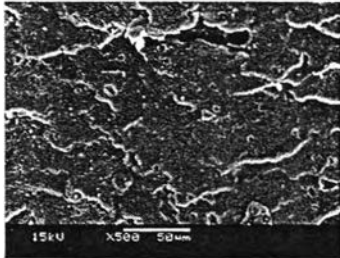
10%wt uncured ENR/PLA

15%wt uncured ENR/PLA

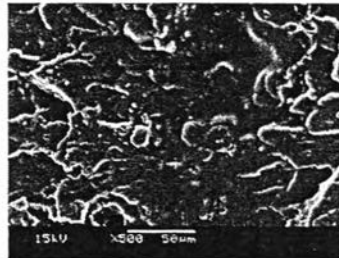


3.2. SEM micrograph of using G2-cured ENR as toughening agent for PLA

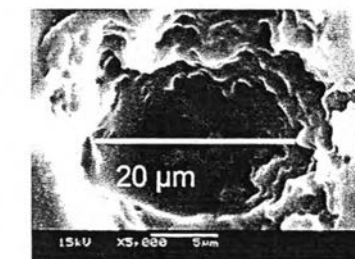
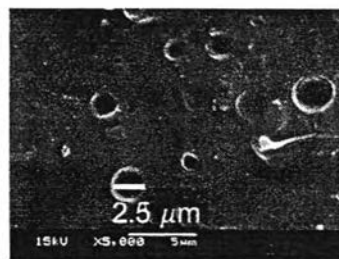
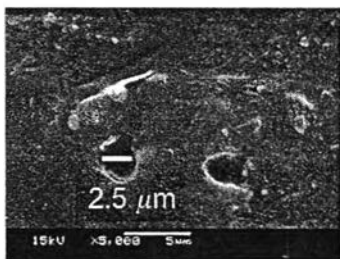
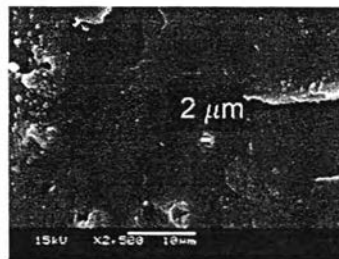
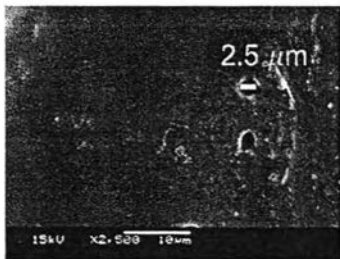
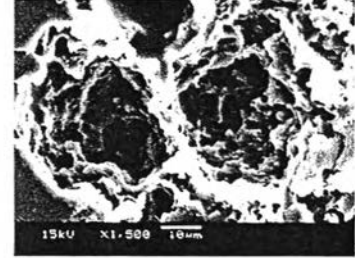
5%wt G2-cured ENR/PLA



10%wt G2-cured ENR/PLA

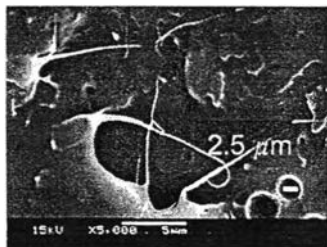
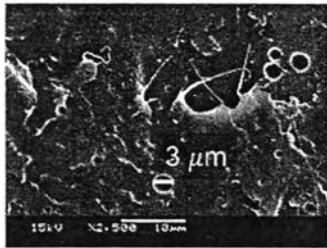
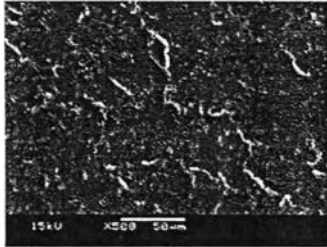


15%wt G2-cured ENR/PLA

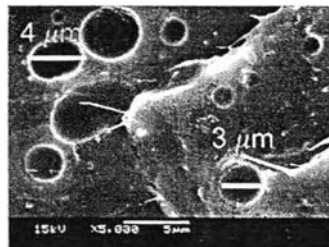
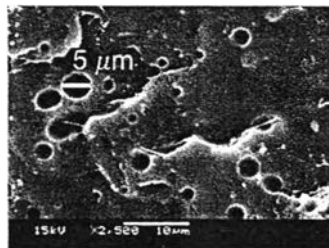
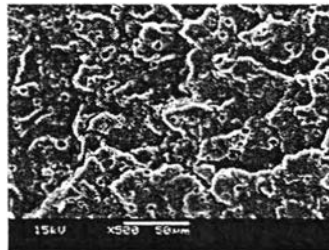


3.3. SEM micrograph of using G10-cured ENR as toughening agent for PLA

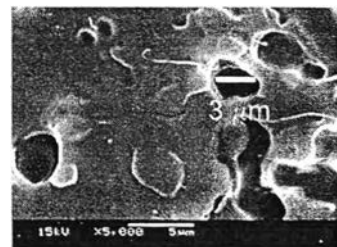
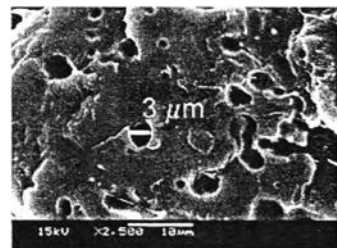
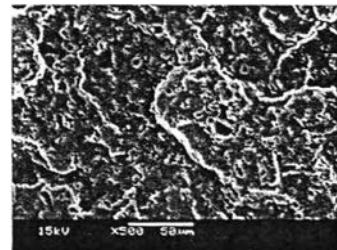
5%G10-cured ENR/PLA



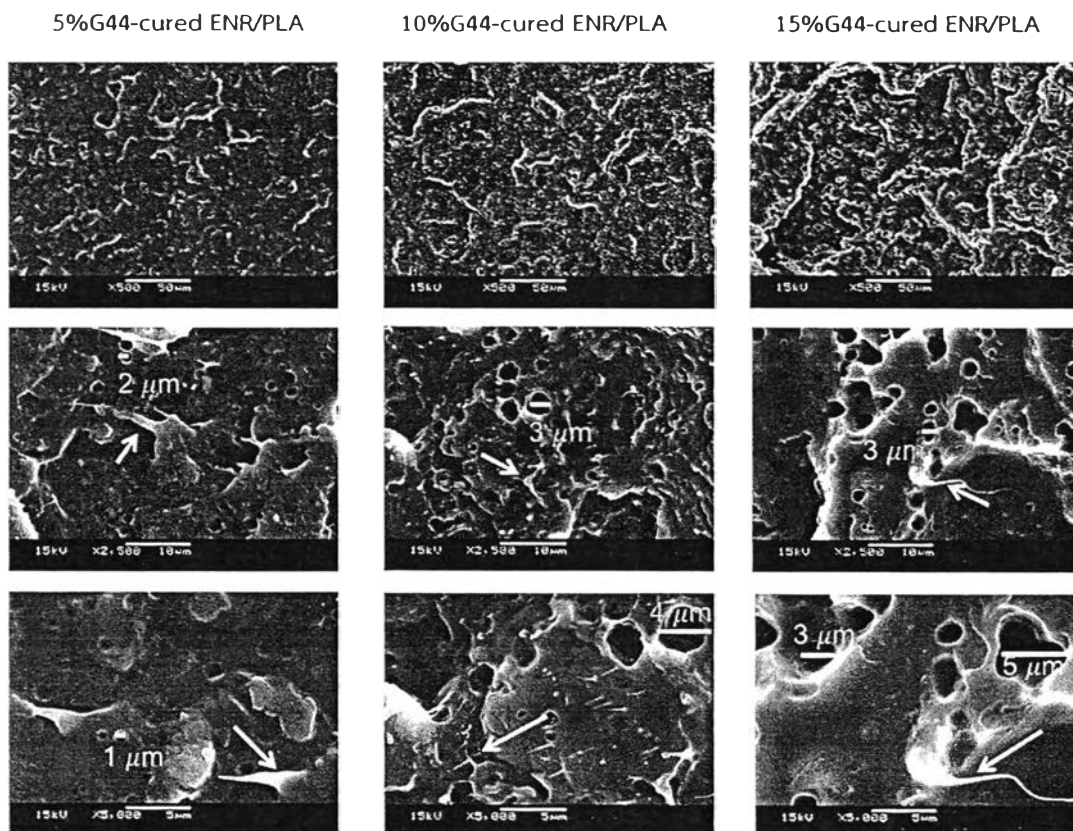
10%G10-cured ENR/PLA



15%G10-cured ENR/PLA



3.4. SEM micrograph of using G44-cured ENR as toughening agent for PLA



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Sukpuang, P., Petchsuk A., Opaprakasit P., and Opaprakasit M. (2010), Compatibility of PLA/NBR/Glycolyzed PLA Blends, paper presented in the 6 th Mathematics and Physical Sciences Graduate Congress (MPSGC) 2010, Kuala Lumpur, Malaysia.

Sukpuang, P., Petchsuk A., Opaprakasit P., and Opaprakasit M. (2009), Lactic Acid-Ethylene Terephthalate Copolymers from Glycolyzed Products : Synthesis and Characterizations, paper presented in the International Conference on Green Sustainable Innovation (ICGSI) 2009, Chiang Rai, Thailand.

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