

4.5 Effect of hydrogen peroxide on HENR properties

In order to investigate the effect of hydrogen peroxide on hydrogenation degree, a series of experiments were carried out over the mole ratio of H_2O_2 to C=C from 0.5 to 1.5 with a fixed amount of C=C of ENR (1.2 mole) and a mole ratio of the other parameters; hydrazine to $H_2O_2 = 1$ under a reaction temperature of $40^\circ C$ for 6 h. From Figure 5, it can be seen the hydrogenation degree slightly increases as the mole ratio of $H_2O_2/C=C$ increases. The amount of H_2O_2 is an important factor in the diimide generation. Therefore, the increased level of hydrogenation at higher amount of H_2O_2 may be due to the high amount of diimide generation

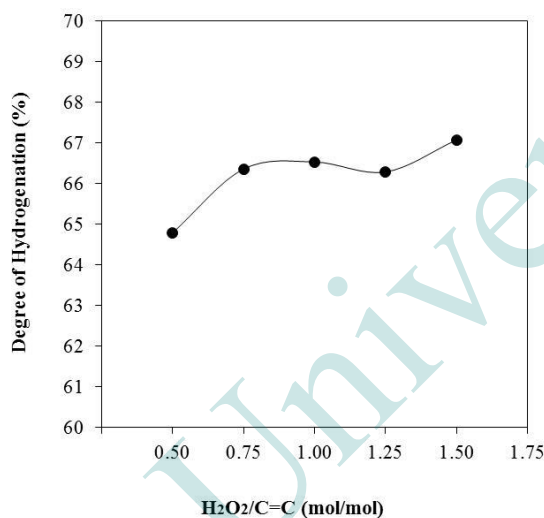


Figure 5 Effect of $H_2O_2/C=C$ ration on HENR properties. Condition: mole ratio of $N_2H_4/H_2O_2 = 1$, reaction time = 6 h and reaction temperature = $40^\circ C$.

5. Conclusion

The hydrogenation of ENR latex was carried out by using a redox system consisting of hydrazine and hydrogen peroxide with boric acid as a promotor. Overall the results showed that an increment in the mole ratios of N_2H_4/H_2O_2 , $H_2O_2/C=C$ and reaction time and temperature directly affect the increase in the degree of hydrogenation.

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7. References

- Hong, S.-G., Chan, C.-K., Chuang, C.-C., Keong, C.-W. and Hsueh, Y.-P. (2005). The Curing Behavior and Adhesion Strength of the Epoxidized Natural Rubber Modified Epoxy/Dicyandiamide System. *J Polym Res*, 12, 295.
- Sharif, N. F. A., Mohamad, Z., Hassan, A. and Wahit, M. U. (2012). Novel epoxidized natural rubber toughened polyamide 6/halloysite nanotubes nanocomposites. *J Polym Res*, 19(1).
- Singha, N. K., Bhattacharjee, S. and Sivaram, S. (1997). Hydrogenation of Diene Elastomers, Their Properties and Applications: A Critical Review. *Rubber Chem. Technol*, 70(3), 309.
- Yu, H., Zeng, Z., Lu, G. and Wang, Q. (2008). Processing characteristics and thermal stabilities of gel and sol of epoxidized natural rubber. *Eur Polym J*, 44(2), 453.