

**THE INFLUENCE OF CURING TIME ON THE KINETIC
ABSORPTION BEHAVIOUR OF SUNFLOWER OIL IN NATURAL
RUBBER/SODIUM BICARBONATE COMPOSITES**

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This Final Year Project Report entitled “**The Influence of Curing Time on the Kinetic Absorption Behaviour of Sunflower Oil in Natural Rubber/Sodium Bicarbonate Composites**” was submitted by Nurfatin Azyyati binti Mohd Noorman in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

This study investigates the effect of curing time variation on the kinetic absorption behavior of sunflower oil in natural rubber/sodium bicarbonate composites. Natural rubber foams, known for their lightweight and cushioning properties, are widely used in automotive, aerospace and sports industries. The purpose of this research is to understand how curing time influences the absorption and diffusion properties of these composites. Natural rubber composites were prepared by mixing natural rubber with sodium bicarbonate and dicumyl peroxide, followed by curing at 150°C for different durations (0, 1, 3, 5 and 10 minutes). Fourier-Transform Infrared (FTIR) Spectroscopy was used to analyze the chemical properties and cross-linking bonds in the samples. The weight gain and swelling uptake measurements assessed their oil absorption behavior. The results indicated that increased curing time led to higher cross-linking density, reducing the oil absorption capacity of the composites. FTIR analysis revealed significant structural changes in the rubber matrix due to curing. Kinetic sorption studies showed that the pseudo-second-order kinetic model better described the absorption behavior of the composites. In conclusion, curing time significantly affects the oil absorption behavior of natural rubber/sodium bicarbonate composites, with longer curing times resulting in lower oil absorption due to increased cross-link density. These findings have implications for improving the performance of natural rubber in various applications, including automotive, aerospace and oil spill management.

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