

The effect of ionic cross linker on Self-healing natural rubber

Abstract

The performance of rubber used for engineering purposes are depending on the selection of raw materials, followed by the processing of the rubber into final products. Although the products been made as robust as possible, rubber still failed through crack and fatigue. In this work, the effect of ionic cross linker by association of different amount of Zinc thiolate has been investigated to emerge autonomous self-healing ability to the materials. The self-healing mechanism of the materials was evidence by FTIR and swelling analysis. Healing performance and efficiency has been carried out using tensile test to investigate the self-healing ability. The results revealed that the material recovered its initial properties in 10 minutes and the tensile strength recovered almost 90% after healing process at room temperature without any external stimulus. The SEM observation showed that the intermolecular diffusion occurred between the fractured surfaces and healed the materials.