Development of Anti-Bacterial Coatings Based on Nano Composite Using Graphene Oxide and Clove Oil

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ABSTRACT

The objectives to be achieved in this Research Group's research are i) to prepare graphene oxide (GO) nanomaterials using the Hummers method, ii) to characterize GO nanomaterials based on UV-Vis, FTIR, and XRD spectroscopy tests, iii) to carry out GO / PAM nanocomposite preparations / clove oil, and iv) studied the anti-bacterial properties of the nanocomposites produced against S. aureus bacteria.

This research is an experimental research. In general, the way this research works begins with the manufacture of GO nanomaterials using the Hummers method. Furthermore, various characterizations were carried out on the GO nanomaterials using the UV-Vis spectrophotometer, FTIR spectrometer, and XRD. Then, GO / PAM / clove oil nanocomposite was prepared through PAM polymer as an intermediary. Finally, the nanocomposite anti-bacterial test was carried out against S. aureus bacteria.

UV-Vis test results from GO and GO / PAM / clove oil nanocomposites showed absorbance peaks at 233.5 nm and 215.56 nm wavelengths. The results of the FTIR test of the GO sample yielded functional groups –OH, C = C, and C-O, while the GO / PAM / crushed oil sample showed functional groups N ? H, ?OH, C = C, C ? O. XRD test results for graphite and GO material showed the peak intensity at an angle of 2θ at 26? respectively; and 10? and 42?. Antibacterial test results showed that GO / PAM / clove oil nanocomposites could inhibit S. aureus bacteria as indicated by an inhibition zone diameter of about 8.7 mm and an optimal inhibition time of 18 hours.

Kata Kunci: *GO, GO/PAM/Minyak Cengkeh, antibacterial, S. aureus*