

**APPLICATION OF NANOCOATING BASED ON NANOEMULSION OF
KAFFIR LIME (*Citrus hystrix* DC.) LEAF OIL AS ANTIBACTERIAL ON
DISPOSSABLE MASK**

ABSTRACT

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Kaffir lime leaf essential oil (KFL-EO) have antibacterial activity but have low solubility in water and have volatile properties. Therefore, it is necessary to develop nanoemulsion formulation to increase the solubility of hydrophobic active substances, increase the bioavailability and bioactivity of essential oils. This research aims to create a nanoemulsion formula from KFL-EO, to determine the physical characterization and to determine the antibacterial ability of KFL-EO nanoemulsion against *Escherichia coli* and *Staphylococcus aureus*. KFL-EO is obtained from water steam distillation with a yield of 0.71%, density 0.85 g/mL, refractive index 1.45 and optical rotation -9.25. The GC-MS analysis showed 5 major compounds identified are citronellal, linalool, sabinene, citronellyl acetate, serta geranyl acetate. Nanoemulsions are formulated using ionic gelation method with a ratio of chitosan:STPP: KFL-EO (5:1:1) with a particle size of 185.8 nm and PI 0.35. The SEM characterization showed a fairly even distribution of the nanoemulsion on the mask fibers. The antibacterial activity test resulted in the largest inhibition zone of 33.3 mm against *Staphylococcus aureus* and 15.6 mm against *Escherichia coli*, both of which were categorized as strong.

Keywords : Nanoemulsion, essential oil of kaffir lime leaf, antibacterial, disposable mask