

Research Title: Green Chemistry for Synthesis Silver Nanoparticles and Its Application for Antimicrobial Activity on Air Filter

Researcher: Ekarat Detsri

Faculty: Science **Department:** Chemistry

King Mongkut's Institute of Technology Ladkrabang

ABSTRACT

This research was conducted to find the optimum conditions for the synthesis of silver nanoparticles. Silver nanoparticles synthesis from silver nitrate solution with polyelectrolyte acts stabilizing agent that is poly(acrylic acid) (PAA), poly(4-styrene sulfonic acid - co - maleic acid) (CoPSS) and poly(methacrylic acid) (PMA) by photo-reduction underneath energy from ultraviolet-c radiation (UV-C) (wavelength range 100 - 280 nm) and select the optimal conditions for analyze with transmission electron microscope, zetasizer and UV-Visible Spectrophotometer for assure silver nanoparticles capped with stabilizing agent. Then applied to the ammonia sensor and oxalic acid sensor and measure the absorbance by UV-Visible Spectrophotometer found that the silver nanoparticles solution to take coloration. In addition lead the air filter is also applied to the antimicrobial activity. Due to remove the air filter immersed in silver nanoparticles solution by using the layer-by-layer technique and confirm the attached silver nanoparticles on air filter by scanning electron microscope was found silver nanoparticles attached on air filter. Then be analyzed exhibit antimicrobial activity due to selected test against *Staphylococcus aureus*. Antimicrobial capability of these air filter found to be effective.

Keywords : green chemistry, photo reduction, silver nanoparticles, application