

**SYNTHESIS OF THE SILVER NANOPARTICLES BY USING
MORINDA CITRIFOLIA'S ROOTS FROM HOT WATER
EXTRACT AND THEIR DEGRADATION
OF METHYLENE BLUE**

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ABSTRACT

SYNTHESIS OF SILVER NANOPARTICLES USING *MORINDA CITRIFOLIA*'S ROOT FROM HOT WATER EXTRACTS AND THEIR DEGRADATION OF METHYLENE BLUE

The synthesized silver nanoparticles (AgNPs) using the *M. citrifolia* extract hot water (MHW) was applied for photocatalytic degradation dye. Nanoparticles (NPs) had been synthesized by various methods which used the toxic chemical. The objectives of this study are to extract *M. citrifolia*'s root using hot water and to synthesize the AgNPs for methylene blue (MB) dye degradation. Powder of *M. citrifolia* was added with hot water at 100 °C. The AgNPs was prepared by mixing 90 ml of AgNO₃ solution with the MHW extract heated for 15 minutes and the colour changes from light yellow to brown. The effect of initial pH of MHW, incubation time, temperature, different concentration of MHW and AgNO₃ were investigated in the formation of AgNPs. The AgNPs synthesized was analysed by using FTIR and UV-vis spectrophotometer. The application on the photocatalytic degradation of dyes was determined by UV-vis spectrophotometer. After exposing to solar light, the AgNPs degraded the dye nearly 96.9% after 6 hours. The intensity of absorbance peak of methylene blue (660 nm) was decreased while intensity for AgNPs (420 nm) increased over the time. This study revealed that the MHWN have a good catalytic activity on the reduction of methylene blue dye and can be used as an alternative method for water treatment in future.