



Abstract of ICRU

Sustainable Community Development



The 1st ICRU International Conference: Sustainable Community Development

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Organized by Chiang Mai Rajabhat University
February 18–20, 2019
The Empress Hotel Chiang Mai

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Green Synthesis of Silver Nanoparticles Using *Melaleuca cajuputi* Powell Leaves Extract and Their Antioxidant Activity and Catalytic Degradation of Dyes

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Abstract

Nowadays, release of hazardous dyes from textile industries in water bodies like lakes, rivers and groundwater has become a serious problem, which contributes to increase their pollution levels significantly. These pollutants are difficult to remove by traditional water treatment procedures. Therefore, there is still a need to develop more suitable methods for effluent treatment. Here, silver nanoparticles were produced using *Melaleuca cajuputi* Powell leaves. The obtained materials were characterized using UV-Vis spectroscopy SEM/EDX, LPSA, and FTIR techniques. UV-Vis spectra showed maximum absorption peak at 406 nm, which represents the characteristic surface plasmon resonance of the nanosilver. The structure of the particles was spherical as observed in SEM. FTIR analysis was carried out to probe the possible functional groups involved in the synthesis of AgNPs. LPSA data showed the mean particle size 49 ± 1.0 nm. The obtained silver nanoparticles were then utilized as nanocatalyst for decolorization of methylene blue (MB) and methyl orange (MO) dye solutions. The report emphasizes that the AgNPs are observed to be an excellent catalyst on reduction of both hazardous dyes with the percent degradation of MB and MO were 92.41% 89.08%, respectively. Moreover, AgNPs synthesized had higher anti-DPPH radical activity than extract.

Keywords: green synthesis, silver nanoparticles, *Melaleuca cajuputi* Powell, antioxidant activity