Bacteria removal in wastewater by using silver nanoclusters material

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Abstract: Many parameters are used to identify the clean water for use. From those parameters, the total coliform bacteria (TCB) and fecal coliform bacteria (FCB) are normally used to estimate the water quality. The contamination of bacteria and other microbes in the water can cause many waterborne diseases, so the disinfection method is necessary applied. Chlorination method is normally used for this purpose; however, the side effects of this method are concerned. The alternative methods are developed to avoid these, and silver nano technology is one of interesting alternative method. Many studies indicated that silver nano material (1-100 nm) can efficient kill bacteria in water. Due to smaller particle size may achieve the higher efficiency of bacteria removal, so this study will synthesize the silver nanoclusters (1-5 nm) called AgNCs and study its efficiency on bacteria removal in wastewater of Khon Kaen University wastewater plant. The batch tests (the effects of support, dose, contact time, and pH) are used to study its efficiency. The result shows that PAD 610AgCNs, 0.5 g/L, 3 hrs and pH 7 is the best optimum condition of AgNCs for the highest TCB and FCB removal with measuring by Most Probable Number Method (MPN).

Keywords: Total coliform bacteria; Fecal coliform bacteria; Silver nanoclusters; Most Probable Number Method