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Degradation of Organic Pollutants using Green Synthesized Bimetallic Nanoparticles: A Kinetic Study

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Abstract: *Nanotechnology is an interdisciplinary field that encompasses various disciplines of engineering, biology, physics and chemistry, which deals with nanoscale materials. It is a multiple areas field which covers diverse domains from the synthesis of nanoparticles (NPs) from plants is a green chemical approach that combines nanotechnology and plant biotechnology. Plant metabolites such as sugars, terpenoids, polyphenols and others play an important role in reducing metal ions to nanoparticles. So to complete the goal; a biological approach to filling in the gaps is imminent; For example, green synthesis uses extracts from biological sources from plant sources, which are superior to chemical and biological methods. Water pollution is defined as the existence of toxic bio- logical agents and chemicals that exceed the normal level of water and may pose a detrimental effect to human health and the environment. In the current report, here we synthesized silver, copper bimetallic nanoparticles (BMNPs) via a novel, robust, and inexpensive method using leaf extract of Azadirachta Indica as reducing as well as capping agent. The synthesized Ag-CuNPs was tested for degradation and degradation kinetics using Methyl Orange dye (MO) through an advanced oxidation process (AOP). The obtained kinetic result indicates the rate of degradation of MO induces significantly in presence of small concentration of BMNPs (1×10^{-8} s^{-1}) and UV-Visible spectrum changes are used to analyze the structure of intermediate and end products during the degraded process. This work promises good environmental safetyagainst dye contamination in water based systems.*

Keywords: Nanotechnology, Green Synthesis, Bimetallic Nanoparticles, Degradation.

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