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Nanotechnology role in the long-term sustainability of water resources

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Today's scientific problems in industrial wastewater treatment and drinking water treatment are enormous. The scientific community has been challenged to move toward newer breakthroughs and technologies as part of a global strategy for environmental conservation and ecological biodiversity. Our focus is on nanotechnology in environmental engineering, and future trends in water and wastewater treatment. Because water is necessary for life. Freshwater makes up only 2.5 percent of the total amount of water on the planet. Also, many people die because of a lack of clean and safe drinking water than because of conflict, terrorism, or weapons of mass destruction. Water contamination is growing increasingly complex and harder to eliminate as the world's population grows. Many regions of the world are confronting multiple issues in providing a sustainable supply of water because of global climate change, and the size of these challenges is fast increasing. As a result, wastewater reuse is becoming increasingly widespread. Treatment of polluted wastewater is necessary for healthy living due to the presence of water contaminants such as heavy metals, organic pollutants, and a variety of other complex substances. Nanotechnology has the potential to create efficient, cost-effective, and environmentally sustainable solutions for providing clean water and drinkable water for human consumption. Various methods of water purification, such as sedimentation, filtering, and chemical or biological degradation, are incapable of destroying new contaminants. As a result, nanotechnology-based devices hold promise in the treatment of water and wastewater. The rapid and continuous advancements in nanotechnology tools hold a lot of promise for future water quality concerns. Our work briefly discusses nanotechnology's recent advancements and uses in wastewater treatment. Numerous creative ways for creating nanoparticles and subsequently using them for wastewater treatment are discussed. These techniques range from the development of nanomaterial-based membranes to the use of catalysts to break down harmful chemicals.

Recent Publications

1. Fawzy, M., Hasham,A., Houta, M. H., Hasham, M., Helmy, Y. A. (2021): COVID-19: Risk assessment and mitigation measures in healthcare and non-healthcare workplaces. Ger. J. Microbiol. 1 (2): 19-28.
2. Fawzy, M., Khairy, G. M., Hesham, A., Rabaan, A. A., El-Shamy, A. G., & Nagy, A. (2021): Nanoparticles as a novel and promising antiviral platform in veterinary medicine. Archives of Virology, 166(10), 2673-2682.
3. Hesham, A., Awad, Y., Jahin, H., El-Korashy, S., Maher, S., Kalil, H., & Khairy, G. (2021). Hydrochar for Industrial Wastewater Treatment: An Overview on its Advantages and Applications. J Environ Anal Toxicol, 11(3).
4. Eman Bedier Abd-Elbaset Ali, Ahmed Mohamed Hesham, (2021), Practical Approach to Improve Biogas Produced from Poultry Manure, International journal of engineering research & technology (IJERT) NREST – 2021 (Volume 09 – Issue 04): 157-160.
5. Ahmed Hesham, Gasser Khairy, Hossam S. Jahin, Yasser Mahmoud Awad, Sabry El-Korashy. (2021, Feb. 26-28), Dates kernels utilization for green adsorbent preparation and rapid characterization technique for produced hydrochar, 1st International Industrial Chemistry Conference - NED University of Engineering & Technology, Karachi, Pakistan.

Biography

Ahmed Mohamed Hesham obtained his M. Sc. in environmental chemistry from Ain Shams University. Plus earned his Ph.D. in inorganic and analytical chemistry from Suez Canal University, Egypt. Ahmed has been involved with studies related to environmental applications using both green and nanotechnology. Ahmed has been serving as a reviewer of reputed Journals.

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