

Role of Microplastics on Reducing Heavy Metal Pollution from Wastewater

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Abstract : Plastic pollution does not disappear, it gets smaller and smaller through photolysis which are caused mainly by sun's radiation, thermal oxidation, thermal degradation, and biodegradation which is the action of organisms digesting larger plastics. All plastic pollutants have exceedingly harmful effects on the environment. Together with the COVID-19 pandemic, the number of plastic products such as masks and gloves flowing into the environment has increased more than ever. However, microplastics are not the only pollutants in water, one of the most tenacious and toxic pollutants are heavy metals. Heavy metal solutions are also capable of causing varieties of health problems in organisms such as cancer, organ damage, nervous system damage, and even death. The aim of this research is to prove that microplastics can be used in wastewater treatment systems by proving that they could adsorb heavy metals in solutions. Experiment for this research will include two heavy metal solutions; one including microplastics in a heavy metal contaminated water solution, and one that just includes heavy metal solution. After being sieved, absorbance of both mediums will be measured with the help of a spectrometer. Iron (III) chloride (FeCl₃) will be used as the heavy metal solution since the solution becomes darker as the presence of this substance increases. The experiment will be supported by Pure Nile Red powder in order to observe if there are any visible differences under the microscope. Pure Nile Red powder is a chemical that binds to hydrophobic materials such as plastics and lipids. If proof of adsorbance could be observed by the rates of the solutions' final absorbance rates and visuals ensured by the Pure Nile Red powder, the experiment will be conducted with different temperature levels in order to analyze the most accurate temperature level to proceed with removal of heavy metals from water. New wastewater treatment systems could be generated with the help of microplastics, for water contaminated with heavy metals.

Keywords : microplastics, heavy metal, pollution, adsorbance, wastewater treatment

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