Sustainable Fabrication of 3D Printing Filament From Recycled Plastic Bottles

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This project explores a cost-effective and environmentally sustainable approach to the production of 3D printing filament by utilizing recycled (PET) plastic. Moreover, it presents a comprehensive methodology for collecting, processing, and transforming post-consumer PET plastic into high-quality 3D printing filament. The recycling process involves the purification of PET plastic through mechanical and chemical treatments, ensuring the removal of impurities and contaminants. The resulting recycled PET (rPET) materials undergoes extrusion and filament formation, achieving a filament quality comparable to traditional counterparts. The mechanical and thermal properties of the (rPET)-based filament are characterized, demonstrating its feasibility for various 3D printing applications. By repurposing PET plastic waste into 3D printing filament, this work contributes to the circular economy and mitigates the environmental impact of plastic disposal. The sustainable fabrication process not only addresses the growing demand for eco-friendly materials in additive manufacturing but also promotes resource efficiency by reducing reliance on virgin plastic. This work serves as a valuable foundation for the development of environmentally responsible practices within the 3D printing industry, fostering a more sustainable and responsible approach to material production This project is not like any project you may see because we have made sure to gather all the problems encountered by others in similar projects, solve these problems, and create a special machine that is free from most of the issues encountered in previous experiments. This project will make a difference in recycling plastic issues .

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