An E-Waste Management Initiative for Developing Countries: Using Acrylonitrile Butadiene Styrene, High Impact Polystyrene, Polypropylene, Polyvinyl Chloride, Rubber and Aluminosilicate Glass to Make a Composite Material

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In 2016, 44.7 million metric tons of E-waste was generated globally out of which only 20% was recycled (UN, 2017). Our project explores how components of e-waste i.e. acrylonitrile butadiene styrene, high impact polystyrene, polypropylene, polyvinyl chloride, rubber and aluminosilicate glass can be used to make a strong, environmentally friendly composite material as an E-waste management initiative. We collected the plastics, rubber and glass from an e-waste recycling centre, shredded and ground them. The plastics were melted and while in molten state, the ground, melted rubber and crushed glass were added. We did this using different ratios of plastics to rubber to glass including the general sample ratio of 1:1:1, followed by 3:2:1, 3:2:2 and 3:1:2. The mixture was poured into molds of different shapes and sizes according to the tests that it was subjected to. After cooling at around 23? for 50 minutes, the material was removed and subjected to various tests; tensile test, compressive test, flexural test, impact test and coefficient of friction test, and all the above mentioned under different temperatures. From our experiments, we realized that only certain ratios can be used to make a strong composite material. We concluded that the composite of ratio 3:2:1, made of plastics, rubber and glass from e-waste (most of which is disposed off in landfills), has the qualities of an efficacious infrastructural material and is a suitable, effective e-waste management technique.

Awards Won:
Fourth Award of $500