

REPROCESSING OF PLASTIC WASTES AT PLACE OF GENERATION

Joshi, Yash Vasant

St. Xavier's High School, Mumbai

Winner, Individual Project, Intel STDF 2001

Municipal solid wastes typically have 8-10% of plastics, such as PE bags, PET bottles, disposable PP fabrics, PVC articles, in diverse forms and shapes that are difficult to identify and separate. Thermoplastic wastes, which are theoretically recyclable, often end up in incinerators or landfills due to difficulty in segregation of mixed plastic wastes by types.

Commercial reprocessing of plastic wastes begins with segregation of plastics by their types and conversion in reusable pellets. Presently, these activities are undertaken in large scale, where all plastic wastes are carried to and processed.

This technology of 'cold-top melting' radically alters the situation as it enables plastic wastes to be locally compacted / pelletised in very simple and inexpensive gadgets acting as 'active litterbins'. Compact and automatic 'push-type extruders' incorporating the technology can be located wherever plastic wastes are generated, such as homes or offices, with each extruder handling specified type of plastic. Thermostatically controlled electrical heaters heat the plastic contents at bottom of each extruder barrel to preset temperatures between 110 - 150 deg. C. Plastic fed from the top progressively lowers in the barrel, till it eventually extrudes out of the die in semi-molten condition, where it is immediately pelletised. These saleable pellets fall in a container. The column of plastic at top of the barrel scrubs and condenses the obnoxious vapours emanating from the molten plastic, thus avoiding air pollution.

The new technology for recycling plastics helps richer and poorer communities to protect their environment in commercially profitable way.