REMOVAL OF ODOURS IN RECYCLED PLASTICS

PATENTED TECHNOLOGY

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ABSTRACT

The research group "**Waste, Energy, Environment and Nanotechnology (REMAN)**" of the **University of Alicante** has developed a procedure for the elimination of odours in recycled plastics by steam stripping.

This procedure comprises the following stages: (i) separation and conditioning of plastic; (ii) shredding of plastic; (iii) chemical washing with surfactant; (iv) rinsing of plastic material; (v) mechanical drying; and, (vi) deodorization of plastic. This last stage is done in a steam distillation column and is where the volatile organic compounds (VOCs) are extracted from the clean, dry material by steam distillation, and where the VOC-free plastic exits at the bottom of that column.

In this way, it is possible to improve the quality of recycled plastics and increase the reuse of plastics from both domestic and industrial waste as raw material for products for later use.

Companies interested in the commercial exploitation of this technology through licence agreements and/or technical cooperation are sought.

ADVANTAGES AND INNOVATIVE ASPECTS

This technology has the following advantages:

- The result is a clean product that is a plastic free of VOCs and odours with an increased quality in comparison with the recycled plastics obtained by conventional recycling.
- By increasing the quality of recycled plastic, new opportunities appear in the market for this type of plastic (e.g., packaging in the cosmetics and hygiene sector).
- Fully environment-friendly procedure.
- It boosts the reduction of plastics in landfills.
- It reduces the production costs in the industries of the sector compared to other technologies such as supercritical CO2 extraction.
- The deodorization module is a hermetically closed circuit that allows heat recovery.
- The deodorization module can act as an independent module of the recycling process. In this case, pellets recycled by other companies are fed into the system for removing malodours and improving the quality of the material.
- The organic phase obtained consists of essential oils (e.g., limonene or pinene) that can be marketed or reused as fuel for steam generation.

INNOVATIVE ASPECTS OF THE TECHNOLOGY

Given the existing background in this field of technology, there are no known processes that are based on the removal of odours by steam

stripping. Therefore, the main innovative aspect of this invention is the removal of odours in recycled plastic by steam stripping.

By means of this process that removes the odours in plastics originating from domestic and industrial sources, it is possible to solve the issues of conventional washing and increase the application of these plastics as raw materials in the polymers industry.

MARKET APPLICATIONS

The present invention manages to remove contaminants, and with them, volatile organic compounds (VOCs) that produce bad smell in recycled plastics. This process extracts the VOCs by steam stripping. This invention is applied to plastics of varied nature, such as polyethylene, polypropylene, polyester, etc. from plastic waste, whether of industrial or domestic origin.

Therefore, this procedure could be useful in the plastic recycling sector or manufacturers of plastic containers as an initial stage to ensure the quality of the raw material.

COLLABORATION SOUGHT

Companies interested in acquiring this technology for its commercial exploitation through technology transfer agreements (see below) are sought.
Patent licensing agreements.

Technical cooperation agreements (R&D projects) for the use of the technology or application in other waste or sectors.

Subcontracting agreements for technical assistance, training, etc.

Profiles of companies sought:

Recycling of plastic waste.

Manufacturers of plastic containers.

Producers of virgin raw material.