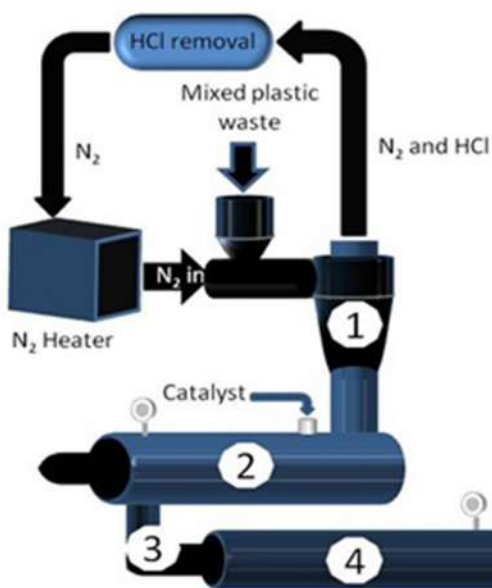


A Novel Pyrolysis-reforming Process for Fuel Oil Recovery from Mixed Plastic Waste

Overview

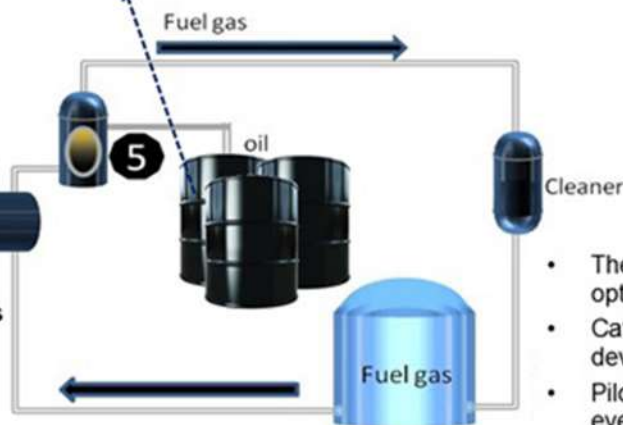
In Singapore, about 730,000 tonnes of plastic waste end up at incineration plants annually. These wastes represent an invaluable pool of resources that could be up-recycled to make high value-added fuel oil instead of going into incineration plants.



Stage I: The mixed plastic wastes go through the stepwise catalytic pyrolysis to convert into raw oil vapour



Stage II: The raw oil vapour is upgraded into high quality fuel oil in the reforming reactor



Schematic diagram of the novel pyrolysis-reforming process

The project constitutes a sustainable waste management model in the following ways:

- Developing a higher-efficiency thermal technology with much lower environmental footprint.
- Developing a Singapore-owned technology for fuel oil recovery from heterogeneous mixed plastic waste.
- The produced fuel oil is in high demand in Singapore.

Objective

The project target to develop a 'Singapore owned' technology for converting mixed plastic wastes into high grade fuel oil.

Plastic is a petroleum products, hence it can be inversely converted into fuel oil through a two-stage thermal process. In the first stage, an advanced stepwise pyrolysis process is devised to remove the toxic matters and convert mixed plastic waste into oil. In the second stage, the oil is upgraded into high grade fuel. The technology is anticipated to bring substantial environmental, economical, and social benefits to Singapore. The process is shown in the schematic diagram below.

- The novel process will be investigated and optimised
- Catalysts used in stages I and II will be developed respectively
- Pilot scale prototype will be developed eventually