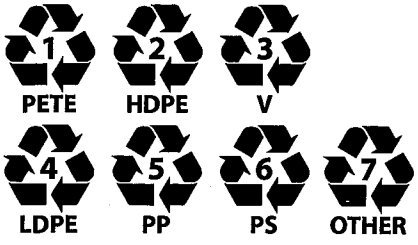
How is reversible change used in recycling? – I

We all know how important it is to recycle as much material as we can. This helps to reduce the volume of rubbish going into landfill sites and to conserve natural resources that are used to make new materials.

Recycling glass and plastic is possible because the chemical properties of both materials allow them to be heated and cooled and yet remain unchanged. But unlike simply melting and refreezing an ice block, industrial recycling is more complicated.



There are many different grades of recyclable plastic, all of which are used for different products. For example, high-density polyethylene (DHPE) is used for plastic jugs and some toys, and low-density polyethylene (LDPE) is used for food wrapping and plastic bags. Have you ever noticed the triangle formed with three arrows which is printed on plastic containers? It usually has a number between one and seven inside the triangle and letters outside it. This label identifies the type of plastic the item is made from and is used when plastics are sorted during the first stage of the recycling process.

After it is separated into its different grades, the plastic is shredded into flakes. In this state, the material is heated to its melting point. The molten plastic is formed into pellets known as nurdles, which are sold in bulk and used in the manufacture of other products (for example, engineered woods like plywood and MDF).

Recycling plastic does not reduce the need for manufacturing new plastic but it can reduce the demand for other resources; for example, less trees are felled to make wood products because engineered 'wood', which is stronger and more durable, is made using the plastic nurdles.

With glass recycling, after it is collected the glass is sorted by colour (green, brown, clear etc.). After this the glass is crushed into small pieces and is then referred to as cullet.

Before the cullet is melted in a furnace, other raw materials used to make glass are added. These include sand, limestone and soda ash. After being mixed at approximately 1500 °C, the glass can be moulded into new bottles and other products.

Like glass, the paper making process is also reversible, allowing the tonnes of waste paper created every year to be used again. Water and chemicals are added to the waste paper, which is then reduced to slurry in a pulper. The pulp goes through a number of cleaning processes before being made into paper again.