

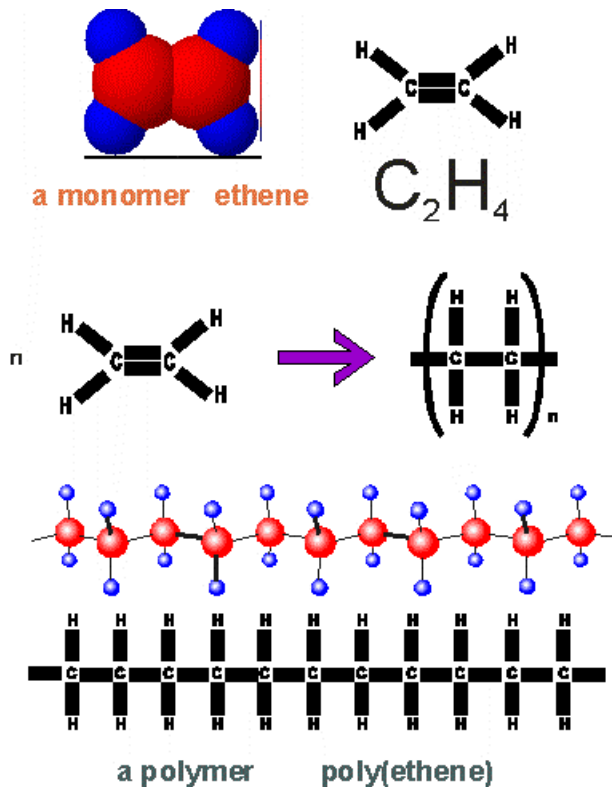
PLASTICS

Most plastics are made from oil. Plastics are man-made materials. They are a useful invention because they are waterproof, easy to shape and tough. They have taken the place of traditional materials like wood and metal in many products. It is bad to waste plastic, as it is made from non-renewable resources and takes a very long time to decay



A bit of Chemistry (Extra information)

Plastics are made of Polymers which are obtained from monomers (low-molecular-weight) by polymerization reactions, in which large numbers of monomer molecules are linked together.



In the image on the left a monomer ethene (C_2H_4) is used to produce a Polymer (poliethene).

Ethene or **Ethylene** -because it contains a carbon-carbon double bond, ethylene is called an unsaturated hydrocarbon.

The process by which we get a polymer is called polymerization. This process has three stages: In the first stage, the monomer is split into two identical parts, each with an unpaired electron (or free electron). Now we have a free radical (A molecule with an unpaired electron). The free radical (second line in the image), forms a new bond with a " neighbor atom " This process

repeats over and over again to form large chains containing thousands of carbon atoms.

EXAMPLES OF PLASTICS

Examples of plastic include PVC, acrylic, polystyrene, expanded-polystyrene, man-made rubber, polythene (or polyethylene, or PET) and nylon. See photos

Plastics		
		
PVC	expanded polystyrene	Thermosetting - Thermosetting
		
Bottles made of Pet	Nylon	Man-made Rubber Sole

CHARACTERISTICS OF PLASTIC

They are relatively cheap.

Plastics are good insulators which makes them safe to use for casing electrical equipment and for the covering on wires.

Most plastics are synthetics and are made from oil.

They are waterproof.

They are light.

Most plastics can be made in different colours or can be clear.

Plastics are non-corrosive and non-toxic

They wash well






They are not biodegradable and cannot be easily recycled.

TYPES OF PLASTIC

THERMOPLASTIC:

Thermoplastics can be heated, moulded and shaped various ways, lots of times. You have probably shaped them in the vacuum former or strip heater in your Technology Room.

Each time a thermoplastic is heated, it tries to return to the shape it first was, usually a flat sheet. This is called plastic memory.

General-purpose thermoplastic	<p>Polythene</p> <p>Low density (PELD) high density (PEHD)</p>	<p>bags, wrappers, receptacles, toys</p>	
	<p>Unsaturated polyesters</p> <p>PET</p>	<p>food containers and bottles</p>	
	<p>PVC</p>	<p>pipes, electrical insulators, waterproof fabrics</p>	
	<p>Polystyrene (PS)</p> <p>expanded polystyrene (EPS)</p>	<p>tableware, containers, protective packaging</p>	
	<p>Polypropylene (PP)</p>	<p>boxes, cases, syringes, food packaging</p>	

High performance thermoplastic	Polyamides (PA) Nylon	coatings of metals, fabrics, ropes	
	Polycarbonate (PC)	helmets, bottles, safety glass	
	Metacrylate (PMMA)	windshield, windows, headlights	
	Teflon (PTFE)	electrical insulation, coatings for pans	

THERMOSETTING –THERMOSTABLE

Thermosetting plastics are generally strong and resistant to heat, but they melt the first time they are heated to a high enough temperature and harden (set) permanently when cooled. They can never be melted or reshaped again. They are used in situations where resistance to heat is important, e.g. on kitchen work surfaces, good-quality plastic cups, saucepan handles and plug casings.

Thermosetting – Thermostables	<p>Phenols Bakelite</p>	<p>electric insulation, plugs, switches, insulating handles</p>	
	<p>Amines Urea (UF) Melamina (MF)</p>	<p>switches, plugs, wood coatings</p>	
	<p>Polyester resins (UP)</p>	<p>Water tanks, boats, pools</p>	
	<p>Epoxy resins (EP)</p>	<p>sports equipment, propellers, aircraft wings</p>	

ELASTOMERS

These plastics have great elasticity. They can reach several times their size when stretched and return their original dimensions after being stretched.

Elastomers	Rubber Natural or synthetic	tires, hoses, gaskets	
	Neoprene	special hoses, seals, diving suits	
	Polyurethanes	foam artificial wheels rubber, leather,	
	Silicone	prosthetic, valves, seals, tubes for medical use.	