



Polyethylene (PE)

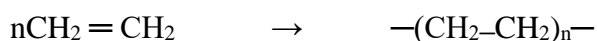
It is obtained by the polymerization of ethylene.

It involves Two steps:

Step 1: Ethylene gas is liquefied under high pressure (at 1500⁰C)

Step II:Liquefied ethylene is then pumped into a heated vessel maintained at 150 to 250⁰C in the presence of traces of oxygen as a catalyst

Polymerisation



Properties

1. Polyethylene is a rigid , waxy white translucent nonpolar material
2. It is resistant towards strong acids and alkalis
3. It is very good insulator of electricity

There are two kinds of polyethylene

- I. Low Density Polyethylene (LDPE)
- II. High Density Polyethylene (HDPE)

LDPE:

S.No	Low Density Polyethylene (LDPE)	High Density Polyethylene (HDPE)
1	Prepared under high pressure using oxygen as a catalyst	Prepared under low pressure using Ziegler Natta Catalyst
	It is branched polymer and 40% crystalline	It is completely linear polymer and 90% crystalline
	Density: 0.91-0.92 gms/ml	Density:0.965 gms/ml
	Melting point:110-125 ⁰ C	Melting point-145-150 ⁰ C
	At high temperature it is soluble in CCl ₄ ,toluene and xylene	Almost insoluble in all the solvent
	Used for making films table cloth	Used for making toys pipes and



	packing material etc.	detergent bottles etc
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LDPE



HDPE

Ziegler Natta Catalyst



Polyvinyl Chloride (PVC)

Preparation:

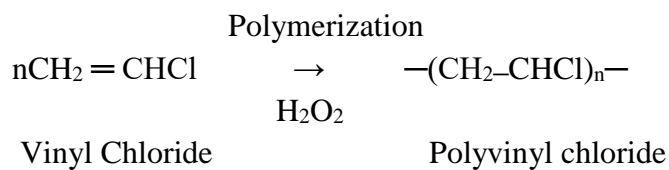
Preparation of PVC involves the following two steps

Step 1: Vinyl Chloride is prepared by treating acetylene with hydrogen chloride at 60 to 80°C in the presence of metal chloride as catalyst.



(Vinyl Chloride)

Step II: Poly vinyl Chloride is obtained by heating a water emulsion of vinyl chloride in the presence of a small amount of benzoyl peroxide or hydrogen peroxide in an autoclave under pressure.

**Properties:**

PVC is non flammable, chemically inert powder.

It is colourless and odourless. It shows resistance to light and atmospheric oxygen

It is insoluble in inorganic acids and alkalis, but soluble in hot chlorinated hydrocarbons such as ethylchloride.

Uses: It is used for making sheets which are employed for tank lining, light fitting, safety helmets, refrigerator components, mudguards etc.,

It is used in the production of pipes, cable insulators, table covers, and rain coats etc.,

