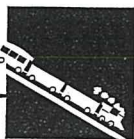


Polymers from Monomers

Monomer	Polymer
Ethylene $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{H} \end{array}$	Polyethylene $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \end{array}$
Propylene $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{CH}_3 \end{array}$	Polypropylene $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 \end{array}$
Vinyl Chloride $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{Cl} \end{array}$	Polyvinyl Chloride (PVC) $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{Cl} & \text{H} & \text{Cl} & \text{H} & \text{Cl} \end{array}$
Styrene $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{C}_6\text{H}_5 \end{array}$	Polystyrene $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{C}_6\text{H}_5 & \text{H} & \text{C}_6\text{H}_5 & \text{H} & \text{C}_6\text{H}_5 \end{array}$
Acrylonitrile $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{CN} \end{array}$	Polyacrylonitrile $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{CN} & \text{H} & \text{CN} & \text{H} & \text{CN} \end{array}$
Methyl Methacrylate $\begin{array}{c} \text{H} \quad \text{CH}_3 \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{CO}_2\text{CH}_3 \end{array}$	Plexiglas™ or Lucite $\begin{array}{cccccc} \text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 & \text{H} & \text{CH}_3 \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{CO}_2\text{CH}_3 & \text{H} & \text{CO}_2\text{CH}_3 & \text{H} & \text{CO}_2\text{CH}_3 \end{array}$
Vinyl Alcohol $\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{H} \quad \text{OH} \end{array}$	Polyvinyl Alcohol (PVA) $\begin{array}{cccccc} \text{H} & \text{H} & \text{H} & \text{H} & \text{H} & \text{H} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{H} & \text{OH} & \text{H} & \text{OH} & \text{H} & \text{OH} \end{array}$
Tetrafluoroethylene $\begin{array}{c} \text{F} \quad \text{F} \\ \quad \\ \text{C} = \text{C} \\ \quad \\ \text{F} \quad \text{F} \end{array}$	Teflon (Polytetrafluoroethylene) $\begin{array}{cccccc} \text{F} & \text{F} & \text{F} & \text{F} & \text{F} & \text{F} \\ & & & & & \\ -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C} & -\text{C}- \\ & & & & & \\ \text{F} & \text{F} & \text{F} & \text{F} & \text{F} & \text{F} \end{array}$



Addition and Condensation Polymers

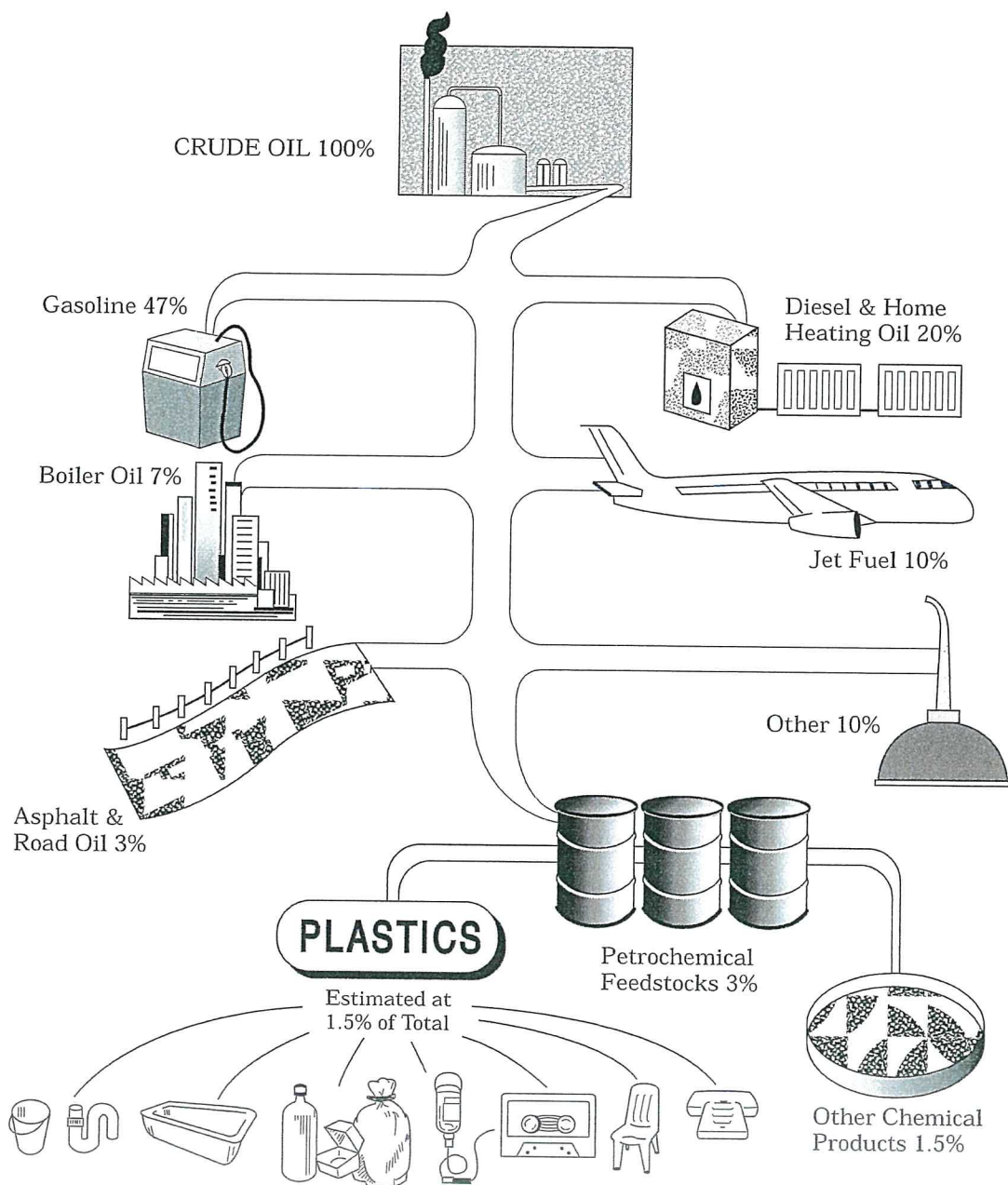
Addition Polymers

Monomer	Polymer	Uses
Ethylene	Polyethylene	Films, coatings, bottles, toys
Propylene	Polypropylene	Fibers, films, bottles, lab equipment
Vinyl chloride	Polyvinyl chloride (PVC)	Credit cards, phonograph records, floor tiles
Styrene	Polystyrene	Insulation, packing materials, coffee cups
Acrylonitrile	Polyacrylonitrile	Orlon, Acrilan, rug fibers
Vinyl acetate	Polyvinyl acetate	Latex paints
Methyl methacrylate	Polymethyl methacrylate	Glass substitutes, jewelry
Vinyl alcohol	Polyvinyl alcohol (PVA)	Glues
Tetrafluoroethylene	Polytetrafluoroethylene	Heat-resistant coatings

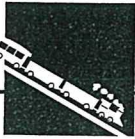
Condensation Polymers

Monomer	Polymer	Uses
Adipic acid, hexamethylene diamine	Nylon	Fibers, bearings
Orthophthalic acid, glycerine	Alkyd resins	Paints
Toluene diisocyanate, ethylene glycol	Polyurethane	Foam plastic, insulation
Dimethyl terephthalate, ethylene glycol	Dacron polyester Mylar	Fibers, plastic bottles

From Crude Oil to Plastics, I



Source: U.S. Energy Information Administration, *Petroleum Supply Annuals*



From Crude Oil to Plastics, II








Most crude oil is turned into fuel for transportation. Less than 2 % is used as feedstock in making plastics. Here's a breakdown of all the ways the United States uses crude oil.

GASOLINE	Of all the crude oil refined for use in the United States, almost half (47%) becomes gasoline for automobiles, boats and other gasoline-driven motors.
JET FUEL	Airplanes consume 10%, in the form of jet fuel.
DIESEL FUEL AND HOME HEATING	Another 20% becomes distillate, two-thirds of which is diesel fuel for trucks, buses and other diesel engines, and one-third home heating oil.
BOILER OIL	Boiler oil, or residual fuel oil, which makes up 7% of crude oil consumption, is used on ships, in industrial boilers and in power plants to produce electricity.
ASPHALT AND ROAD OIL	Asphalt and road oil account for 3% of crude oil consumption.
OTHER	Some of the crude oil, about 10%, is used as non-energy feedstocks for manufacturing products such as lubricants, wax, coke for steel making, and naphthas that are used in the drycleaning process.
PETROCHEMICAL FEEDSTOCKS	Petrochemical feedstocks, products of the refining process, make up the remaining 3% of all crude oil consumption. Half are used to make PLASTICS (1.5% of the total) for thousands of items such as tableware, furniture, aircraft and automobile parts, luggage, surfboards, helmets, medical supplies and packaging. The remaining 1.5% is used to make products such as solvents, synthetic fibers for wearing apparel, synthetic rubber, paints and coatings.
IMPORTANT CONSIDERATION	Plastics bring about savings in energy use. For example, parts for cars and trucks are increasingly made of plastic to reduce their weight, and that means better fuel economy. Plastics packaging and other plastic products usually weigh less than their alternatives, and this saves fuel in shipping.

For more information contact (800) 333-0124, or write:

Mobil Chemical Company
Solid Waste Management Solutions
1159 Pittsford-Victor Road
Pittsford, NY 14534

Plastic Container Code System for Plastic Bottles

Code	Material
 1	PETE Polyethylene terephthalate (PET)*
 2	HDPE High-density polyethylene
 3	V Vinyl/polyvinyl chloride (PVC)*
 4	LDPE Low-density polyethylene
 5	PP Polypropylene
 6	PS Polystyrene
 7	Other All other resins and layered multimaterial

* Stand alone bottle code is different from standard industry identification to avoid confusion with registered trademarks.