

Some Common Addition Polymers

Name(s)	Formula	Monomer	Properties	Uses
Polyethylene low density (LDPE)	$-(\text{CH}_2-\text{CH}_2)_n-$	ethylene $\text{CH}_2=\text{CH}_2$	soft, waxy solid	film wrap, plastic bags
Polyethylene high density (HDPE)	$-(\text{CH}_2-\text{CH}_2)_n-$	ethylene $\text{CH}_2=\text{CH}_2$	rigid, translucent solid	electrical insulation bottles, toys
Polypropylene (PP) different grades	$-(\text{CH}_2-\text{CH}(\text{CH}_3))_n-$	propylene $\text{CH}_2=\text{CHCH}_3$	<u>atactic</u> : soft, elastic solid <u>isotactic</u> : hard, strong solid	similar to LDPE carpet, upholstery
Poly(vinyl chloride) (PVC)	$-(\text{CH}_2-\text{CHCl})_n-$	vinyl chloride $\text{CH}_2=\text{CHCl}$	strong rigid solid	pipes, siding, flooring
Poly(vinylidene chloride) (Saran A)	$-(\text{CH}_2-\text{CCl}_2)_n-$	vinylidene chloride $\text{CH}_2=\text{CCl}_2$	dense, high-melting solid	seat covers, films
Polystyrene (PS)	$-(\text{CH}_2-\text{CH}(\text{C}_6\text{H}_5))_n-$	styrene $\text{CH}_2=\text{CHC}_6\text{H}_5$	hard, rigid, clear solid soluble in organic solvents	toys, cabinets packaging (foamed)
Polyacrylonitrile (PAN, Orlon, Acrilan)	$-(\text{CH}_2-\text{CHCN})_n-$	acrylonitrile $\text{CH}_2=\text{CHCN}$	high-melting solid soluble in organic solvents	rugs, blankets clothing
Polytetrafluoroethylene (PTFE, Teflon®)	$-(\text{CF}_2-\text{CF}_2)_n-$	tetrafluoroethylene $\text{CF}_2=\text{CF}_2$	resistant, smooth solid	non-stick surfaces electrical insulation
Poly(methyl methacrylate) (PMMA, Lucite, Plexiglas)	$-(\text{CH}_2-\text{C}(\text{CH}_3)\text{CO}_2\text{CH}_3)_n-$	methyl methacrylate $\text{CH}_2=\text{C}(\text{CH}_3)\text{CO}_2\text{CH}_3$	hard, transparent solid	lighting covers, signs skylights
Poly(vinyl acetate) (PVAc)	$-(\text{CH}_2-\text{CHOCOCH}_3)_n-$	vinyl acetate $\text{CH}_2=\text{CHOCOCH}_3$	soft, sticky solid	latex paints, adhesives
cis-Polyisoprene natural rubber	$-(\text{CH}_2-\text{CH}=\text{C}(\text{CH}_3)-\text{CH}_2)_n-$	isoprene $\text{CH}_2=\text{CH}-\text{C}(\text{CH}_3)=\text{CH}_2$	soft, sticky solid	requires vulcanization for practical use
Polychloroprene (cis + trans) (Neoprene)	$-(\text{CH}_2-\text{CH}=\text{CCl}-\text{CH}_2)_n-$	chloroprene $\text{CH}_2=\text{CH}-\text{CCl}=\text{CH}_2$	tough, rubbery solid	synthetic rubber oil resistant