

Polystyrene (PS, $\triangle 6$)

Color key:

black = carbon

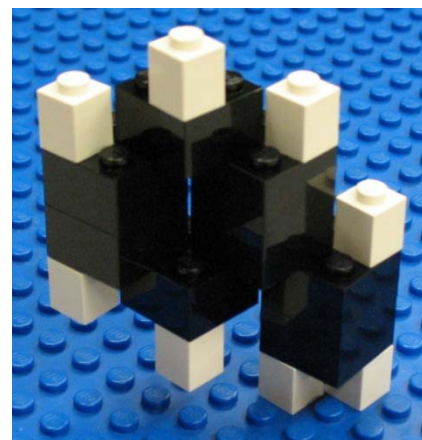
white = hydrogen

Monomer for
the addition
polymerization:

This model requires:

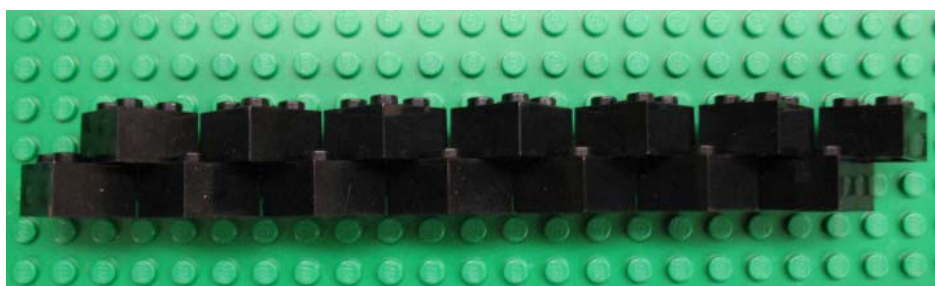
8 black 2x2 bricks

9 white 1x1 bricks

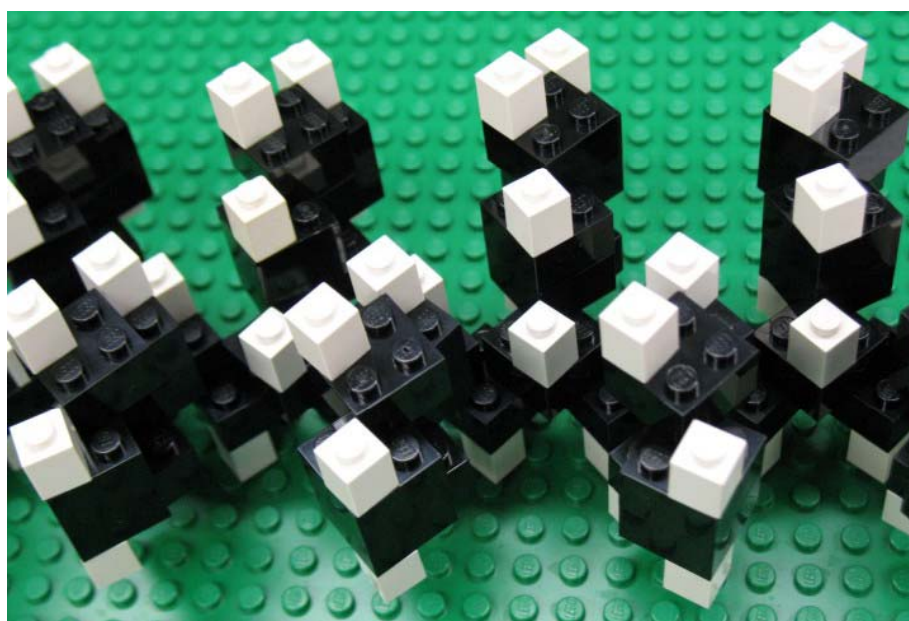


styrene

Building the carbon
backbone first might
aid in construction.

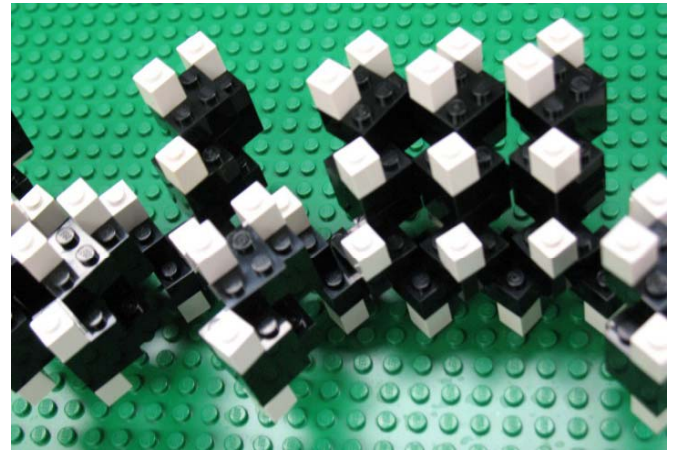
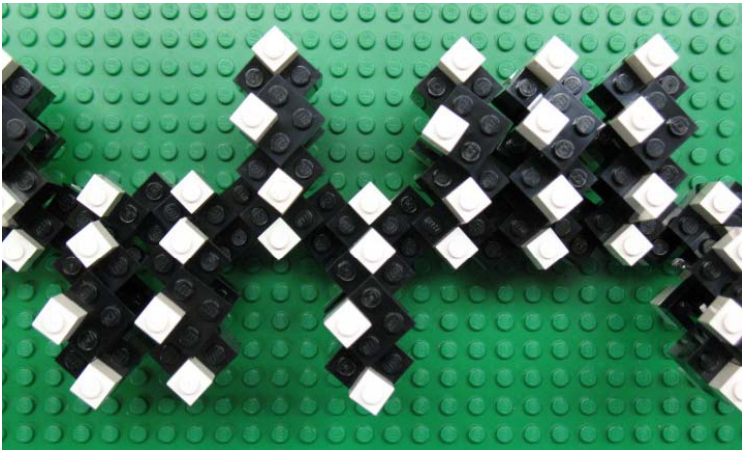


The structure is similar to high density polyethylene, except one of the two hydrogen atoms on every other carbon atom has been replaced with phenyl ($-C_6H_5$) group. These bulky groups reduce the flexibility of the chains and produce a relatively stiff polymer.

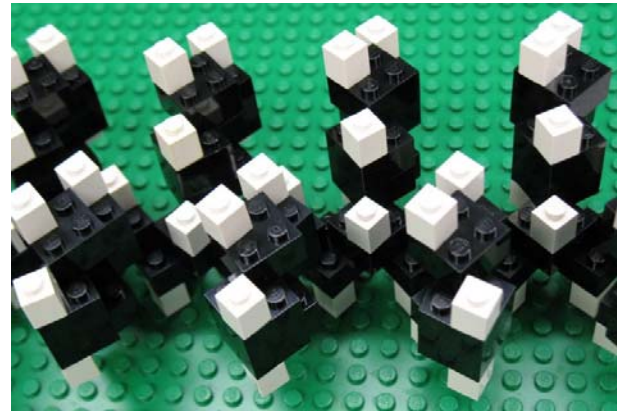
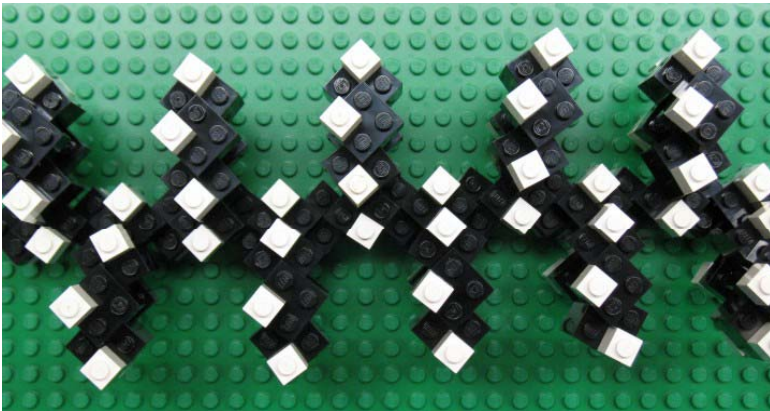


Polystyrene can be produced with varying arrangements of the phenyl groups along their chains.

Atactic polystyrene has phenyl groups located randomly on either side of the chain.



Syndiotactic polystyrene has alternating phenyl groups located on opposite sides of the chain.



Isotactic polystyrene has all phenyl groups located on the same side of the chain.

