

## extension

### Chemistry in Action

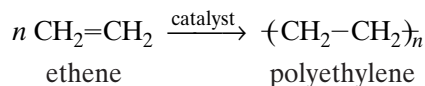
Go to [go.hrw.com](http://go.hrw.com) for a full-length article on high-barrier plastics.



Keyword: HC60RGX

## Addition Polymers

An *addition polymer* is a polymer formed by addition reactions between monomers that contain a double bond. For example, molecules of ethene can polymerize with each other to form polyethene, commonly called polyethylene.



The letter  $n$  shows that the addition reaction can be repeated multiple times to form a polymer  $n$  monomers long. In fact, this reaction can be repeated hundreds or thousands of times.

### Forms of Polyethylene and Related Polymers

Various forms of polyethylene, shown in **Figure 18**, have different molecular structures. High-density polyethylene (HDPE) is a linear polymer. It has a high density because linear molecules can pack together closely. One use of HDPE is in plastic containers such as milk and juice bottles because HDPE tends to remain stiff and rigid.

**FIGURE 18** Properties of the different forms of polyethylene are reflected in their uses. Linear molecules of polyethylene can pack together very closely, as shown in the model of high-density polyethylene (HDPE). The branches of branched polyethylene keep the molecules from packing tightly as shown in the low-density polyethylene (LDPE) structure. The cross-links of cross-linked polyethylene (cPE) make it very strong.

