



What is a Polymer?

Summary

As products become more complicated in design and formulation, it becomes challenging for specialized engineers and scientists to fully understand their existing product line, as well as innovate on pipeline projects, if they lack fundamental understanding of materials. Cambridge Polymer Group offers workshops and short courses on polymer science, and can train scientists, engineers, managers and sales staff on both the basics of polymers, as well as more detailed discussions of specific aspects of polymers and their uses and processing.



What is a polymer?

- A macromolecule composed of repeated segments, or repeat units

1.5 Å

Polymer = 'poly - mers' = 'many parts'

Repeat unit

$$\left[\begin{array}{c} \text{H} \\ | \\ \text{---C---} \\ | \\ \text{H} \end{array} \right]_n$$

$M_0 = 62 \text{ g/mole}$
 $n = \text{degree of polymerization}$

$M_w: 1,000 \text{ to } 10,000,000 \text{ g/mole} = nM_0$
 $n = 20 \text{ to } 160,000$
Length = $1.5\text{\AA} \times 160,000 = 24 \text{ microns}$ (~human hair)

Monomers ~ Organic compounds

adhesives fibers proteins

plastics Cross linked rubbers

gas liquid grease wax solid

Degree of polymerization Polyethylene

Description

CPG offers a one day workshop that covers the basics of polymers, encompassing polymerization, testing, manufacturing, and sterilization issues of common polymers. The workshop is focused on biomedical applications of polymers, and is suited to those with a basic understanding of science.

CPG has also developed custom workshops for clients on subjects specific to their product lines, such as hydrogels, permanent implants, and cleanliness of biomedical devices. CPG has trained clients' sales staff on differentiating their products from the competition based on polymer properties and performance.