

Research Methodology in Chemistry

Edited by
Fiona N.-F. How, Ph.D



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CHAPTER – 1

NATURAL POLYMERS

Rosliza Binti Mohd. Salim

Polymers are abundant in nature. The most abundant of all is the silicate, $(\text{SiO}_2)_n$, which is the main ingredient of many rocks. The most intriguing inorganic polymer is diamond, which is made of all Csp^3 in three dimensional array. Graphite is a two dimensional carbon polymer. Sapphire is also a polymer made of $(\text{Al}_2\text{O}_3)_n$. These are all called inorganic polymers. Organic natural polymers are found in cotton and wood (cellulose), wool and silk (protein), and grains (starch). DNA and RNA are also polymers with tremendously high molecular weights. Some representative natural polymers are discussed more detail as follows.

Natural Rubber

Natural rubber is made from the sap of a rubber tree, which looks like milk. This sap is called rubber latex and consists of suspensions of approximately 30-40% rubber, 2.5% protein, and 2% resin in water. The natural rubber is made of purely *cis*-1,4-polyisoprene, except for the few units near the beginning of the molecule. The beginning few units are *trans*-1,4-polyisoprene as well as active phosphate ester structures.

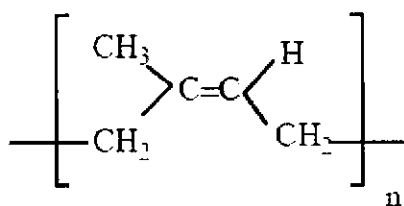


Figure 1.1: *cis*-1,4-polyisoprene

Cellulose