

# Reading About Recycling:



Have you ever been asked if you had a latex allergy? Latex is one name for natural rubber. The special properties of latex rubber make it ideal for many purposes, including automobile tires. You can find it in many other everyday products like mats and track surfaces, mouse pads, and elastics.

Natural rubber is sometimes called India rubber or caoutchouc (cow-chook). It is an elastic hydrocarbon polymer. That means its molecules are much like loose pieces of rope. They stretch and fold. When rubber is stretched the long molecules can no longer vibrate. Their extra energy is released as heat.

Natural rubber comes from the sap of tropical trees. Even though synthetic rubber can now be produced, the natural form still comprises about 45 percent of the rubber we use. It provides some of the raw material for automobile tires.

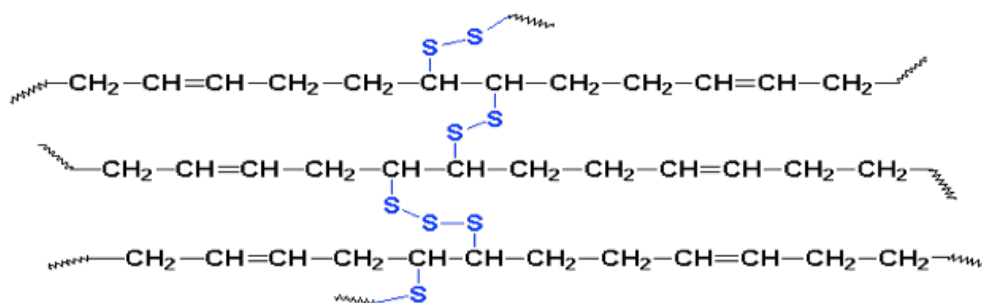


Image credit: Polymer Science Learning Center

But growing rubber trees places strains on tropical environments. A rubber tree lives for about 32 years. When it grows it uses a great deal of water and nutrients especially during the seasons when water is scarce. Many regions of the world where rubber trees are grown are suffering droughts due to climate change. So re-using the rubber we harvest takes on added importance.

When rubber was first used for products in Europe in the 18th Century it became an instant fad. But rubber boots were soft in the summer sun and brittle in winter heat. Charles Goodyear invented a way to make it more durable in 1839. Vulcanization changes the bonds between rubber's long molecules. That improves its resistance and elasticity in lower temperatures. To make a tire, carbon black is often added to make rubber even stronger.

About 21 percent of today's passenger tires are made from natural rubber. Synthetic rubber represents 27 percent and carbon black 28 percent. Because tires are not only rubber but contain steel belts, they must be processed for recycling. There are two main ways to do this. The tires can be frozen (cryogenics) to separate out the rubber. Another method is called ambient grinding. The difference in the two processes is that cryogenics produces a rubber particle that has a smooth surface area and ambient grinding produces a rough surface area. Each process has specific uses in the industry, although ambient grinding is used more often.

## Comprehension Questions:

1. Name two properties of rubber: \_\_\_\_\_
2. Why does natural rubber need special processing before we use it? \_\_\_\_\_  
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3. Describe the shape of a rubber molecule: \_\_\_\_\_  
\_\_\_\_\_
4. What property of rubber makes it good for tires, mouse pads, and tracks? \_\_\_\_\_  
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5. Create a diagram below to describe a cycle where natural rubber is used and then recycled. Conduct research to help you as necessary.