CHAPTER I
INTRODUCTION

Polymeric matrix nanocomposites are already established as a new class of materials that draws more and more attention from scientists around the world. Because of its nanoscale dispersion of inorganic component, acting as reinforcing filler, in the matrix of polymer, the nanocomposite possesses superior properties that can not be attained by the conventional microscale counterpart. The significantly improved properties are mechanical, thermal, barrier, and electrical properties thereby leading to many innovative applications and opening to new business opportunities.

Currently, for white and light-colored products, clay, calcium carbonate, and silica are always used as fillers in order to reduce cost of raw materials and, in some cases, act as reinforcing substances. Unlike finely divided silica, clay in the pristine form is not reinforcing filler. However, it can be changed to be reinforcing filler if the aggregation of silicate layers, in the structure of clay, is divided into individual nanoscale layer. In general, polymer/layered-silicate nanocomposites can be prepared through melt or solution intercalation of polymer molecules and in-situ polymerization in monomer matrices. Unfortunately, the ways to obtain nanoscale dispersion of silicate layers in different types of polymer matrices are quite different and vary from case to case.

Natural rubber (NR) is one of the most plentiful materials that possesses unique properties such as excellent elasticity, toughness, abrasion resistance, and water impermeability. Consequently, NR is a very versatile material used in many applications namely tires, especially truck tires, surgical gloves, hoses, footwear, insulation products, and so on.

ต้นฉบับ หน้าขาดหาย