

CHAPTER 1

INTRODUCTION

1.1 Introduction

Composite materials are new generation materials developed to meet the demands of rapid growth of technological changes of the industry. Composites materials or composites are engineering materials made from two or more constituent materials that remain separate and distinct on macroscopic level while forming a single component. It consists of short and soft collagen fibers embedded in mineral matrix called apatite.

The composite material is defined as a structural materials created synthetically or artificially by combining two or more materials having dissimilar characteristics. One constituent is called matrix phase and other is called reinforcing phase. Reinforcing phase is embedded in matrix to give desire characteristics.

- **Reinforcing phase:** fibers, flakes, particulates, whiskers, etc.
- **Matrix phase:** continuous phase

Ex: concrete, boron reinforced polymer, glass fiber reinforced polymer, epoxy resin reinforced

Composite materials consist of two or more physically or chemically distinct, suitably arranged or distributed phase, with an interface separating them. Most commonly composite material have a bulk phase, which is continuous called the matrix and one dispersed. Non continuous phase called the reinforcement, which is usually harder and stronger. The idea of composite material is not a new or recent one. Nature is full of example where in the idea of the composite material used.

Examples:

1. Coconut plant leaf- cantilever using the concept of fiber reinforcement. Wood is a fibrous composite cellulose fiber in a lignin matrix. The cellulose fiber has tensile strength but is flexible (i.e. low stiffness), while the lignin matrix join the fibers and furnishes the stiffness.