CHAPTER ONE

INTRODUCTION

1.1 General introduction:

Concrete is the second largest material consumed by human beings after food and water. It is obtained by mixing cement, fine aggregate, coarse aggregate and water in required proportions. The mixture when placed in forms and allowed to cure becomes hard like stone. The hardening is caused by chemical action between water and the cement due to which concrete grows stronger with age. [1]

Communities around the world rely on concrete as a safe, strong and simple building material. It is used in all types of buildings (from residential to multistory office blocks) and in infrastructure projects (roads, bridges, etc). Despite its widespread use, many people are unaware of the considerations involved in providing high quality, strong, durable concrete.

The strength, durability and other characteristics of concrete depend upon the properties of its ingredients, proportion of the mix, the method of compaction and other controls during placing, compaction and curing.

To keep a high level of structural safety, durability and performance of the infrastructure in each country, an efficient system for early and regular structural assessment is urgently required. The quality assurance during and after the construction of new structures and after reconstruction processes and the characterization of material properties and damage as a function of time and environmental influences is more and more becoming a serious concern.

1.2 Objectives of the research:

The objectives of this research include:

1. Attempt to transfer the concepts of true and accurate information about constituent material for concrete mix and concrete itself and conform to standard specifications of concrete and reduce the overall cost.
2. Study of the behavior of gum as local additives to detect its influence on the properties of concrete mixes.
3. Looking into, investigation of making use of Gum as an additive to improve workability, cohesion and strength of concrete through which is reflecte on her other properties.
4. Identify the impact of a particular type of Gum (Acacia tortilis) compared to the rest of Gums on the concrete depending on previous studies.

1.3The problem statement:

Since the cohesion of concrete mix is important property to ensure its efficiency and cement play a fundamental role in this property, but it is expensive on the one hand and shows its impact in the pollution of the environment, so it was of interest in this research to study a natural substance and economical of Acacia tortilis to replace a certain percentage of the weight of cement that given the same effectiveness of its properties.

It is known that the benefits of the gums and a major food ration muter nutritional balance our quest to choose a species seldom used that ensures:

1. Achieves safety.
2. Does not affect negatively on the concrete mix or the building.

1.4 Research methodology:

The methodology used to reach the objectives of the research, followed the stages below:

Firstly: Collecting the required information from multiple regions and manufacture of ready mix in Sudan.

Secondly: Design of concrete mixes according to the British code BS8110 and prepared material to be mixed.

Thirty: experimental work of the constituent materials for concrete mix.

Forty: Test of fresh and hardening concrete mix by using slump and compressive strength and discussion of the results.

1.5 Outline of research:

The work presented in this research consists of six chapters

Chapter one provides introduction including general introduction, objectives, problem statement, research methodology and outline of research.

Chapter two includes literature review, the theoretical framework of the components of the of concrete mix and mixing stages, properties of concrete material and methods of testing concrete.

Chapter three presents the definition used for concrete additions of both types of chemical and organic material also includes basic research topic, a gum runny its inception and the physical and chemical properties.

Chapter four contains experimental works for case study results analysis and provides comparison of results and discussions.

Finally chapter six assigned to conclusions and recommendations.