CHAPTER I

INTRODUCTION

Rosin (colophony) is a solid resinous material that occurs naturally in the oleoresin of pine tree. There are three major sources for rosin: from the oleoresin exudate of the living pine tree, from the oleoresin contained in the aged stump of the longleaf pine, and from the tall oil produced as a by-product in the kraft paper industry.

Rosin is a complex of mainly resin acids and a small amount of nonacidic components. Its color, depending on the source and method of processing, can vary from a very pale yellow through dark red to almost black with a tinge of red. It is generally translucent, brittle at room temperature, and has a slight turpentine odor and taste. It is readily soluble in most organic solvents, such as ethyl alcohol, ethyl ether, mineral spirit, and benzene; it is insoluble in water.

Rosin obtained from three major sources is called unmodified rosin. Chemical treatment, such as hydrogenation, dehydrogenation, or polymerization, increases the stability and improves the physical properties of rosin through modification of the phenanthrene-derived moiety; the products are known as modified rosins. Unmodified and modified rosins may also be converted to carboxylic acid derivatives. These modified rosins and rosin derivatives are of great commercial importance.[1]

Rosin contains color bodies or coloring matter visible to the naked eye and certain color bodies which are not normally visible to the naked eye, usually referred to as latent color bodies. The reasons why a rosin is colored may describe as follows:

(1) High molecular weight materials and unsaponifiable materials are contained in the raw rosin. (about 10-15%)

(2) A resin acid having a conjugated double bond which exhibits a high oxygen absorbing property, such as abietic acid is contained in the rosin.

Rosin has been widely used as tackifiers for hot-melt adhesives and pressure-sensitive adhesives, modifiers for rubbers and plastics, raw materials for traffic paints, paper sizing agents, emulsifiers for synthetic rubbers, resins for inks, resins for paint, and the like. When unmodified rosin is used, the end products have yellow or yellowish brown color, the characteristic odor of rosin, and have the defects that the rosin is poor in thermal stability, weatherability, and air oxidation. If rosin is modified to high quality, it can increase the value and range of application.

U.S. Pat. No. 4,906,733 described a process of improving color oxidation and stability qualities of rosin by disproportionation, purification and hydrogenation.

U.S. Pat. No. 4,507,228 described a hydrogenation process for rosin by catalytic hydrogenation in the presence of palladium on carbon catalyst. This patent method was successful in partial hydrogenation.

Objectives and Scope of Study

The objectives of this research were to produced modified and purified rosin by dehydrogenation (disproportionation) and hydrogenation reactions and to characterize the products.

In the disproportionation reaction, palladium on carbon was used as catalyst. Disproportionated rosin was purified by distilling under pressure of 3 mmHg in atmosphere of nitrogen to give purified rosin.

Hydrogenation process was aimed to convert the conjugated double bond to rosin containing saturated compounds in the presence of various catalysts. The optimum conditions such as reaction temperature, reaction time, hydrogen pressure and catalyst concentration by weight of rosin, were determined.