I. INTRODUCTION

1.1 Introduction

In the last two decades thermomechanical treatment has been developed to improve strength , toughness , ductility and weldability of hot rolled product. This process consists of controlled rolling and control of coiling temperature (1). The controlled rolling consists of

1. reheating the slab to an optimum temperature to attain fine initial austenite grain size via control the grain growth and dissolution of precipitate particles
2. deformation in high-temperature austenite region to attain grain refinement via repeated deformation and recrystallization,
3. deformation in the recrystallization region to increase nucleation site for ferrite grains via deformed austenite.

Controlled cooling and control of coiling temperature during austenite-to-ferrite transformation produces fine ferrite grain size coupled with fine precipitate particle. High strength steel with good toughness at low temperature and superior weldability can be produced by optimum combination of controlled rolling and control of coiling temperature

1.2 Objective

To study the effect of controlled rolling and control of coiling schedule in applying thermomechanical treatment, on the mechanical properties of Nb-Ti microalloyed steel.

1.3 Scope

This study focuses on the controlled rolling and control of coiling temperature of Nb-Ti microalloyed steel. The effects of the conducted thermomechanical treatment will be assessed through the evolution of austenite structure, ferrite structure and mechanical properties of rolled material. The effects of reheating temperature, deformation in recrystallization region, deformation in nonrecrystallization region, and coiling temperature will be studied.

1.4 Benefit

1) To understand the effects of thermomechanical treatment process on mechanical properties of Nb-Ti microalloyed steel.
2) As an initial data for further study and research to produce high strength steel with good toughness and weldability.