CHAPTER 1

INTRODUCTION

1.1 HEAT TRANSFER ENHANCEMENT

Heat transfer enhancement is the process of improving the convective mode of heat transfer by increasing heat transfer co-efficient. The augmentation of heat transfer are commonly used in areas such as process industries, heating and cooling evaporators, thermal power plants, air conditioning equipments, refrigerators, radiators for space vehicles and automobiles, etc. Large numbers of research works have been done to increase the heat transfer rate in heat exchanger and also to make the heat exchangers compact in size. The heat transfer rate can be improved by introducing a disturbance to the fluid flow by breaking the viscous and thermal boundary layers. At the same time, the pumping power may increase significantly which ultimately leads to increase in the pumping power cost.

The heat exchanger augmentation techniques are probably classified as active method, passive method and compound method. In the active flow control techniques involves some external power input for the enhancement of heat transfer, whereas for passive flow control techniques does not need any external power input for increasing the heat transfer. A compound method is a hybrid method in which both active and passive methods are used in combination. The compound method involves complex design and hence, it has limited applications.