CHAPTER I
INTRODUCTION

The rapid growth of the world population and their consumption directly influence several core industries such as petroleum refineries, plastics, additives, and especially petrochemical to spread enormously the factory building economics throughout the world. A preponderance of these industrial processes and productions are a hotbed of discharging contaminated water into the environment. In particular, wastewater contains organic contaminants which are harmful for human health, animal health, and the environment. A number of environmental regulations have been launched for industrial treatment in order to reduce toxic contaminants as much as possible before discharging back to the environment. This problem has led to the development of the appropriate treatment for toxic organic contaminants, especially aromatic hydrocarbons (AHs) and polyaromatic hydrocarbons (PAHs) which are difficult to eradicate from the wastewater.

At first glance it looks as if a variety of procedures for separation of this kind of toxic contaminants has been proposed, but in fact, the conventional technologies for the removal of toxic organic solutes are often neither effective nor economical. One exception is adsorption. The adsorption of surfactants on particles has been extensively studied from both fundamental and applicable points of view. One of the intriguing adsorption phenomena is the incorporation of water-insoluble compounds in adsorbed surfactant aggregates, which is called adsolubilization.

In recent years, application of adsorption for environmental remediation and waste treatment has expanded into using adsorbed surfactants onto a surface for changing surface properties of the adsorbent. This method can compete with other methods which have the limitation of high cost and low selectivity. To illustrate further, many industrial wastes contain refractory organics, which are rather difficult to treat by conventional treatment processes. The adsorption and adsolubilization of toxic organics by the conventional surfactant is often enhanced by the addition of a small amount of other surfactants. Many research works report that the surfactant mixtures are superior because they have several advantages over single surfactant. It is hypothesized that mixed block copolymers and conventional surfactants will

enhance adsolubilization and stability more than pure block copolymer or mixed conventional surfactants due to their synergism.

Thus, this research focuses on to study the use of mixed surfactants between conventional surfactant and block copolymer in the adsorption and adsolubilization of organic compounds. Using Pluronic L64 as a block copolymer, this is the first report where the mixed system of this triblock copolymer and conventional surfactants (cationic, anionic, and nonionic) is being studied for organic contaminant removal from wastewater.