CHAPTER I
INTRODUCTION

Nowadays, wastewater which contains toxic organic chemicals is the major problem of chemical and petrochemical industries. It can potentially be hazardous to human health and also to the ecosystem. Especially, people who live in the urban and near the industrial estate are greatly affected if this wastewater is discharged into the environment. At present, various treatment technologies such as coagulation flocculation, chemical oxidation, biological process, adsorption, etc. are available for removal of organic compounds from wastewater. Among various treatment technologies, the adsorption technology is being used extensively for the removal of organic compounds from wastewater. Recently removal of organic contaminants by adsorption onto surfactant-modified solid surface has drawn much attention because this method is not complicated and has low operating cost.

Surfactants adsorbed onto the solid surfaces to form micelle-like structure (hemimicelle or admicelle) exhibit hydrophobic environment so that organic molecules can be incorporated into the surfactant adsorbed layers. This phenomenon is called adsolubilization or surface solubilization. The adsolubilization has been widely used in many applications such as paints, pharmaceuticals, admicellar polymerization, and admicellar catalysis. In addition, the adsolubilization is used in wastewater treatment to collect and remove organic chemicals. One of the main problems hindering utilization of surfactant-modified surface is surfactant desorption. Therefore, polymeric surfactant is used to reduce this problem because it can increase the stability of the surfactant coating on the solid surface (Atthaphong *et al.*, 2010). Recently, the idea of linker molecules has been introduced as a way to increase the water-surfactant-oil interaction and the oil solubilizaion capacity in formulating microemulsion systems, but it has not much been used in adsolubilization. In this study, linker molecules were employed to enhance the adsolubilization of aromatic organic solutes into polymer surfactant on the solid surface.

The purposes of this work were to investigate the impact of linker on the adsorption of EO/PO triblock copolymers onto hydrophobic silica and to study the adsolubilization of various organic compounds into the adsorbed layer of EO/PO

triblock copolymers on hydrophobic silica. Three kinds of EO/PO triblock copolymer with high adsorption and adsolubilization, were used to study the impact of lipophilic linker and combined linker on adsorption and adsolubilization. In addition, various aromatic organic compounds with different polarity and number of aromatic rings were used to study the influence of the structure of the organic molecule on adsolubilization.