



CHAPTER V

CONCLUSIONS

The surfactant adsorption values show a strong dependence on the pore size distribution of Molecular sieve MCM-41. The adsorption isotherms of all three cationic surfactant on various pore size MCM-41 were characteristic S shape isotherm containing 3 regions which exhibited the region II, III and IV. Adsorption of individual surfactant molecules via interaction between the positively charged head group of the surfactant and negatively charged groups at the MCM-41 surface is considered to take place in the initial stage. Region I is non-detectable as a result of monomer interactions with surface. Region II will obviously differ in the steepness of the slope results from ion exchange via the strong electrostatic attraction between the negatively charged MCM-41 surface and the cationic surfactant molecules. Region III and IV of the adsorption is due to hydrophobic interaction of the surfactant alkyl chains. The adsorbed amount at saturation level decreased with increasing the tail length of the surfactants as well as decreasing the pore size. Furthermore, the smallest of surfactant molecules (C8TAB) show the rising part of the adsorption isotherm is slightly shifted towards region II (low concentration) when the pore size decreases. This is mainly due to the influence of electrostatic interaction that is the dominating binding mechanism with the shortest tail length of the surfactant molecules.

Additionally, the effect of surfactant tail length on MCM-41 from the results obtained for adsorption isotherms in each pore size, the C8 surfactant having the shortest tail length was adsorbed greater than the other two surfactants and the C16 surfactant having the longest tail length was adsorbed the least. This indicates that the presence of the hindrance of pore wall and the

hydrocarbon tail causes other surfactant monomers hardly adsorbed inside the pores of the solid surface.