

CHAPTER IV

CONCLUSIONS

In this work, alumatrane complexes were synthesized directly from inexpensive starting material, aluminum hydroxide, and TIS, via the one step process, called “OOPS” process. Mass spectra revealed that products were oligomers. The main product was pentamer bonded with TIS that lost one H₂O molecule. From TGA data, the % ceramic yields of the product from the reactions without and with TETA were 27.6 and 31.9 %, respectively, which are higher value than the theoretical yield (23.7%). The higher percent ceramic yields were due to the small unit of oligomers in the product and the small amount of unreacted Al(OH)₃ remaining in the product.

The integral method was used to study the reaction kinetics. The reaction order was second order overall, first order with respect to aluminum hydroxide and first order with respect to TIS. The dissolution rate increased when the reaction temperature increased. The activation energy of this reaction was about 24±2 KJ mol⁻¹.