

## CHAPTER IV

### CONCLUSIONS

The Silatrane complexes were synthesized directly from inexpensive and widespread available  $\text{SiO}_2$  and triisopropanolamine via the “OXIDE ONE POT SYNTHESIS” process in the presence and absence of TETA. When TETA was present, the reaction time was twice faster. Therefore, TETA could be used as an accelerator for this reaction.

The purified products from the reaction with and without TETA were white solid powder. By  $\text{FAB}^+$ -MS they gave molecular ion peaks at  $m/e = 838$  and  $623$ , respectively. Other characterization studies showed that both products (with and without TETA) displayed similar properties.

As for the kinetic studies, the reaction order for the dissolution process was second order overall, first with respect to  $\text{SiO}_2$  and first with respect to TIS. The reaction rate increased with increasing reaction temperature as indicated in Arrhenius's equation. The activation energy obtained for this reaction was  $55 \pm 4$  kJ/mol.