

CHAPTER V

CONCLUSION

The products were synthesized by a one step reaction (condensation reaction), of pure silica or rice husk ash and amine (TEA or DEA) in EG. When TEA was present, the reaction time was faster than using DEA.

The optimum conditions of all reactions is shown in Table 5.1. The reaction temperature of all reactions were varied from 100-200°C. The reaction was found to occur at 200°C.

The effect of mole ratio of silica and amine of all reaction were varied from 1:0.25-1:1.5. The mole ratio 1:1 provided a optimum percentage conversion for all reactions.

The effect reaction time was varied from 12-54 hour and % conversion of silica content, as shown results in table 5.1. It can be concluded that smaller particle size leads to shorter reaction time.

Table 5.1 The results of optimum condition of reactions

Reactions	Condition			% Conversion of silica content
	Temp (°C)	mole ratio	reaction time (hr)	
1. SiO ₂ 0.007 μm, with TEA and EG	200	1:1	16	100
2. SiO ₂ 10.97 μm, with TEA and EG	200	1:1	30	100
3. Rice husk ash 13.47 μm with TEA and EG	200	1:1	48	35.31
4. SiO ₂ 0.007 μm, with DEA and EG	200	1:1	20	100
5. SiO ₂ 10.97 μm, with DEA and EG	200	1:1	36	100
6. Rice husk ash 13.47 μm with DEA and EG	200	1:1	48	25.38

In this thesis, the productions which were synthesized from pure SiO₂ and rice husk ash with amine and EG. They had silimilar molecular structure. which used same amine, and were characterized in optimum condition as follow:-

The synthetic products by using TEA were found that similar structure were found that the silatrane.in the molecular structure.

The synthetic products by using DEA were found similar structure in molecule. The products from DEA could not be satisfactory characterized.

From the study thermal properties of products from using TEA that was found similar decomposition temperatures to 240 and 390°C and the final ceramics yield at about 24%. In products from using DEA a similar decomposition temperatures to 200 and 350°C and the final ceramics yield at about 50%.

SUGGESTIONS FOR FUTURE WORKS

- The particle size of rice husk ash should be reduced to increase reaction rate and conversion.
- Study surface of rice husk ash
- Characterize DEA product
- Develop purification method