

**SURFACE MODIFICATION
OF CHINA CLAY
TO ENHANCE REINFORCING EFFECT
IN RUBBER COMPOUNDING**

**A PROJECT REPORT SUBMITTED
IN PARTIAL FULFILLMENT OF
THE DEGREE OF
MASTER OF SCIENCE
IN POLYMER TECHNOLOGY**

**SUPERVISED BY:
DR. P.Y. GUNAPALA**

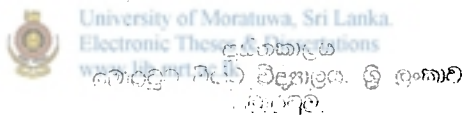
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**UNIVERSITY OF
MORATUWA**

LB/20N/58/00

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SEPTEMBER 1999

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ABSTRACT

This project reviews the surface chemistry of China clay (Kaolin) in the attempt of enhancing the reinforcing effect and the dispersion quality without silanisation or amine addition. The polar chemistry of silica/silicate is resorted due to the fact that china clay (Rubber grade; processed at Boralesgamuwa refinery by Lanka Ceramic Limited) contains approximately 46% SiO_2 and 36% Al_2O_3 by weight.

China clay was oxidized to reduce the agglomeration due to the attraction between Gibbsite to Silicate layers. Then treated with selected polar polymers in aqueous and non aqueous mediums to eliminate hydrophilic nature of clay which causes difficulty of achieving rapid wetting and dispersion in rubber and retarding effect on vulcanisation rates of accelerated sulphur compounds. In addition to the above treatment methods, coarser particles of clay has been eliminated by incremental gravitational sedimentation and the suspension was subsequently flocculated with a polar polymer.

Laboratory investigations of rubber compounds reveal the capability of reacting above polar polymers with silanol groups in china clay particles to promote wetting properties of rubber thereby enhance the dispersion quality, reinforcing effect and cure characteristics of sulphur cure systems when compared with respect to carbon black.(N-330)

ACKNOWLEDGEMENT

My sincere thanks and grateful gratitude to my supervisor Dr. P.Y.Gunapala and co-supervisor Prof. W.L.W. Fernando for their intellectual guidance, assistance and advice rendered for successful completion of this project.

My special word of thanks to Prof. (Mrs.) L.Sivagurunathan, Head of Polymer Technology Division for the assistance and co-ordination extended to me throughout the project.

My thanks are also due to Dr.S.A.Fernando (Senior Lecturer, University of Colombo, Chemistry Dept.), Mr.K.Subramaniam (Senior Lecturer, Polymer Division) Mr.S.S.Perera (Head, Dept. of Chemical Engineering), Mr.J.T.S.Motha (Polymer Laboratory, CISIR), Dr.Gamini Seneviratne (RRI), Mr. Ranjit Ganemulla (Director, Paints & General Industries Ltd.) and Mrs.Malani Dharmatilake (Assistant Director, IDB) for helping me in various ways during the project.

I would like to express my thanks to Mr.Sarath Chandrapala of Microscopy Laboratory, Mr.Sisira de Silva of Polymer laboratory and Mr.A.K Somanatha of Processing Laboratory, University of Moratuwa.

I would like to thank Mrs.M.C.C.Fernando (my wife) for typing the report and her valuable assistance.

Finally I offer my sincere thanks to all personnel for their assistance and for being kind and considerate towards me at all times.