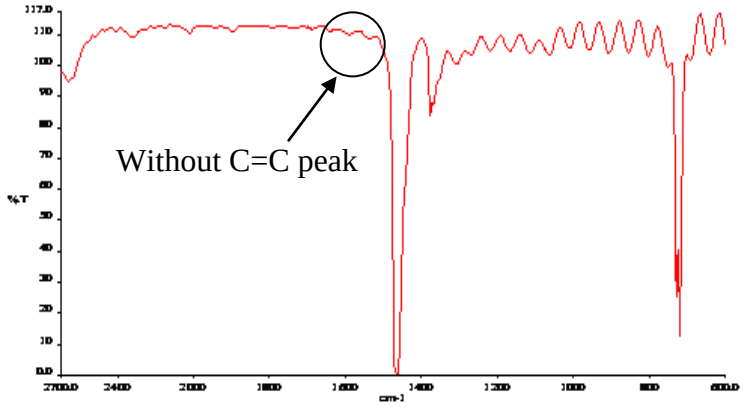

Fig. 13 Chemical Analysis by FTIR for Unaged Specimen

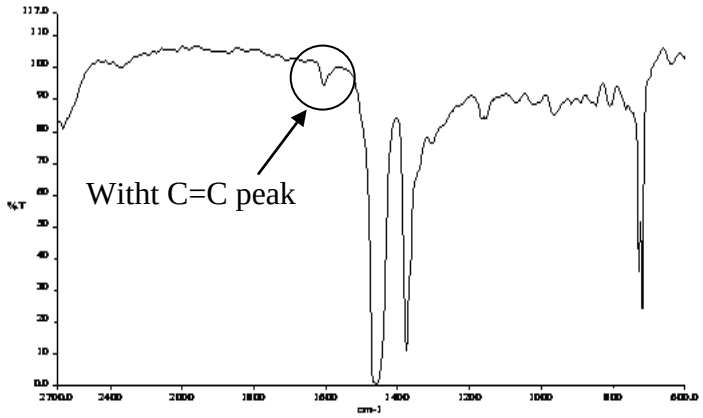

Fig. 14 Chemical Analysis by FTIR for Aged Specimen

After well conducting the experimental and carefully analysis the experimental results, very acceptable results in life time from Crine's model were obtained when comparing with the experimental data. However, accuracy of the experimental results depends on the precisely thickness of specimen, voltage stress stabilization and accuracy of temperature control unit.

7 CONCLUSION

Accelerated ageing test of XLPE insulating material from 22kV high voltage cable was conducted. Three temperature levels, 23˚C, 60˚C and 75˚C, and electrical stress between 75 -140 kV/mm are testing conditions. Electrical stress and time to breakdown were used to evaluate life time of insulating material. Crine's model parameters, ΔV and ΔG values, were obtained from a linear relationship between F^2 and log t. Life time can be reasonable well predicted by Crine's model for given electrical stress and temperature. Acceptable lift time results can be obtained when using Crine's model for calculation. Furthermore, lift time result from Crine's model agree with the experimental data. Physical observation by using SEM and chemical analysis by using FTIR supported the experimental results, as well.

References:

[1] H. Wang, C. J. Huang, L. Zhang, Y. Qian, J. H. Liu, L. P. Yao, C. X. Guo and X. C. Jiang, "On-line partial discharge monitoring system and data processing using WTST-NST filter for high voltage power cable", *WSEAS Transactions on Circuits and Systems*, Vol. 8 , No. 7, July 2009, pp. 609-619.

[2] Y. C. Liang and Y. M. Li, "On-line dynamic cable rating for underground cables based on DTS and FEM", *WSEAS Transactions on Circuits and Systems*, Vol. 7 , No. 4, April 2008, pp. 229-238.