INTRODUCTION

The Physics Department of the Aligarh Muslim University, Aligarh (U.P.) India, has been traditionally very strong centre for Spectroscopic studies since 1930’s. Renowned spectroscopist like late Prof. R.K. Asundi, Prof. P. Venkateswarlu have spend their valuable time at this institution. Many Ph.D. thesis on the Molecular Spectroscopic studies have been submitted since then.

Prof. M.S.Z. Chaghtai joined this Department in 1969 and he started Atomic Spectroscopy in collaboration with late Prof. Bengt Edlen of University of Lund (Sweden) with the laboratory’s assistance of Lund University, Sweden and generous gift of calculations from Dr. R.D. Cowan of Loss Alamoss Scientific laboratory (U.S.A.), a large number of Atomic Spectra have been analysed. About seventy research papers have been published in international journals of repute on various spectra of Y, Zr, Nb, Mo, Sb, I, Xe, Cs, Ba, La, Ce etc. Ten Ph.D. thesis have been submitted so far on the spectral analyses of above - mentioned elements. Most of the earlier work were based on the indentification of resonance transitions in the grazing incidence (50 < λ < 430 Å) region which paved the way for further work. Dr. A. Mushtaq, Dr. Q. Shujauddin, Dr. Z.A. Khan, Dr. A. Tauheed and Dr. Nasreen Ateqad handled the spectra in the normal incidence (260-2530Å) region to study the transitions between the
excited states viz Y V-IX, Zr III-X, Nb III-IX and Mo V-VIII etc. all these works were based on the theoretical support from Dr. R.D. Cowan as well as comparision with isoelectronic behaviour in the sequence.

Dr. Tauheed Ahmad rejoined this Department in 1992 after spending more than five years in Canada with Prof. E.H. Pinnington and Prof. Y.N. Joshi, having learned the techniques of Beam-Foil Spectroscopy and the Analysis of complex spectra. The latter could be only possible with the successful running of Multi Configuration Interaction Code of R.D. Cowan. With the availability of fast computers in India, this code is now operational at Aligarh since 1992.

The laboratory’s assistance of Prof. Y.N. Joshi (Canada) is of great help to this group. Dr. Tauheed Ahmad has recorded beautiful spectra on 3-m normal incidence (260-2080Å) vacuum spectrograph of Antigonish laboratory (Canada) for a large number of elements like Sb, Te, I, Xe, Kr, Cs, Ba, La, Ce, Pr, Nd, Pt, Au, Hg, Pb and Bi etc. The work on many of them have already been published in collaboration with Prof. Y.N. Joshi. The work on Sb and Iodine is in progress at Aligarh.

This thesis is based on the theoretical and experimental investigation of tellurium spectra Te II - Te V, as detailed in the following pages.