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Studies of solid DNA-CTMA films using Raman microprobe spectroscopy FAIZAN AHMAD, PERRY YANEY, University of Dayton — Extensive research has been conducted on the development of deoxyribonucleic acid (DNA) - based electrical and electro-optical devices using purified DNA originally derived from salmon waste. However, the molecular weight of the virgin, as received DNA is greater than 8000 kDa, whereas the electrical and electro-optical properties are optimum at lower molecular weights. High power sonication is used to reduce the molecular weight of the obtained DNA to levels as low as 200 kDa, in which higher power and longer exposure produces lower mean molecular weight. The DNA is then complexed with cetyltrimethl-ammonium chloride (CTMA) to make it water insoluble. To support the various measurements that have been made to confirm that the sonicated material is still double strand DNA and to look for other effects of sonication, Raman studies were carried out to compare the spectra over a wide range of molecular weights and to develop baseline data that can be used in correlation studies when various dopants are added to change the electrical, mechanical or optical properties. Raman microprobe spectra from solid, dry thin films of DNA with molecular weights ranging from 200 kDa to >8 MDa complexed with cetyltrimethyl-ammonium chloride (CTMA) are presented and correlated with the as-received spectrum, the CTMA spectrum and with published DNA spectra in aqueous solutions.

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