

The melting of a DNA double helix into two single strands is a crucial process for life on Earth. Previous experimental data on the self-complementary sequence CTTm<sup>5</sup>CGAAG containing 5-methylcytosine suggests that the melting of an oligonucleotide might be a three-state, rather than two-state process. To assess this, <sup>1</sup>H NMR spectra were measured at varied concentrations of the oligonucleotide in temperatures between 274 and 366 K. Through analysis of the chemical shifts of aromatic hydrogens undergoing fast chemical exchange, we have determined that the most likely intermediate state between a double helix and a single stranded random coil is a structure consisting of two oligonucleotide molecules rather than a structured single strand.