HIGH LEVEL *AB INITIO* INVESTIGATION OF INTERCOMBINATION BANDS OF C_2

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High level *ab initio* calculations were carried out on the $X^1\Sigma_g^+$, $A^1\Pi_u$, $a^3\Pi_u$, $b^3\Sigma_g^-$, $c^3\Sigma_u^+$ and $d^3\Pi_g$ levels of the C_2 radical. Calculations were carried out at the MRCI level with full-valence CASSCF reference wavefunctions and basis sets up to aug-cc-pv6z. The resulting wavefunctions and potential energy surfaces were employed to calculate Einstein coefficients for allowed transitions and intercombination bands. These values were used to model the behaviour of the C_2 system in interstellar and circumstellar environments, paying particular attention to the Red Rectangle (HD 44179).