Dioxetane Chemiluminescence Mechanisms

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Reaction mechanisms of dioxetane chemiluminescence will be discussed based on the following our new experimental observations. (1) High pressure effect on chemiluminescence quantum yield and chemiluminescence spectra of photo-induced chemiluminescence of a thermally stable 3-methoxyphenyldioxetane derivative. (2) Temperature effect (77 K – 300K) on the photo-induced chemiluminescence. (3) Magnetic field effect on chemiluminescence quantum yield of a base triggered dioxetane chemiluminescence at room temperature. (4) High pressure effect on the quantum yield and emission spectra of a base triggered dioxetane chemiluminescence at room temperature. Combining these observations and quantum mechanical study, we will propose potential energy surface of the chemical transformation.