

## Synthesis and Spectral Properties of Alkynyl Substituted Triphenylamines

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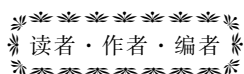
**Abstract:** When electron-deficient nitro-compounds interact with electron-rich fluorescent compounds of alkynyl substituted triphenylamines, it will cause the changes of the conjugate degree and the charge distribution of the fluorescent compounds, resulting in the change of fluorescence. Alkynyl substituted triphenylamines were designed and synthesized via sonogashira coupling reaction using alkynes and halogenated triphenylamines as raw materials. The effects of molecular structure, solvent polarity, and addition of nitro-explosives on the fluorescent properties of alkynyl substituted triphenylamine solution were studied by fluorescence analysis technique. Results show that with the increase of TNT concentration, the fluorescence intensity of the alkynyl substituted triphenylamines weakens gradually. When adding  $2.5 \times 10^{-4} \text{ mol} \cdot \text{L}^{-1}$  of TNT into  $1 \times 10^{-5} \text{ mol} \cdot \text{L}^{-1}$  of alkynyl substituted triphenylamine solution, the obvious fluorescence quenching effect occurs and when the concentration of TNT rises up to  $1 \times 10^{-2} \text{ mol} \cdot \text{L}^{-1}$ , the fluorescence disappears completely. The quenching abilities of the alkynyl substituted triphenylamines to different nitro-explosive are different, so the alkynyl substituted triphenylamines are expected to become the sensitive materials for the detection of nitro-explosives.

**Key words:** alkynyl substituted triphenylamine; nitro-explosive; fluorescence quenching

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