

Fluorinated Modification and Comprehensive Characterization of 9-Aminoacridine Dye with Fluorescence Properties

Muhammad Abu Bakar

Abstract

Fluorination of dyes can significantly increase their quantum yield and photostability, making them more useful for various imaging and sensor applications. In the current study, 9-Aminoacridine dye was modified with fluorinated ponytails of varying lengths and characterized with nuclear magnetic resonance (NMR) spectroscopy, electrospray ionization time of flight mass spectrometry (ESI-TOF-MS), ultraviolet–visible (UV-vis) spectroscopy, and fluorescence spectroscopy. ESI-TOF-MS also confirmed the successful modification of this dye with the fluorinated ponytails. The experimental molecular weights calculated with ESI-TOF-MS for these fluorinated dyes matched the calculated molecular weights. The fluorinated 9-Aminoacridine dyes showed excellent fluorescent properties compared to their parent dye. Similarly, the absorption properties of these fluorinated dyes were observed to be improved. Additionally, the partition coefficients for these fluorinated dyes will be calculated for the toluene/water system ($\ln P_{\text{toluene/water}}$), the toluene/1H,1H,2H,2H-perfluoro-1-octanol (F6H2OH) system ($\ln P_{\text{toluene/F6H2OH}}$), and the 1H,1H,2H,2H-perfluoro-1-octanol (F6H2OH)/water system ($\ln P_{\text{F6H2OH/water}}$).

Keywords: Fluorinated 9-Aminoacridine, Fluorinated ponytails and Partition coefficients.