

Abstract

The pursuit of sustainable and efficient energy sources has become a paramount global concern in recent years. As traditional fossil fuels continue to deplete and environmental concerns escalate, the development of advanced materials for energy storage and conversion has garnered significant attention. In this context, thiadiazolo-quinoxalines (TDQs) have emerged as promising candidates due to their unique electronic properties and potential applications in various energy-related technologies. The analysis of the synthesized compounds included purity assessment and characterization, which were confirmed through FT-IR and Nuclear Magnetic Resonance (NMR) spectroscopy, as well as TLC analysis. To investigate the photophysical properties of the newly synthesized conjugated molecules, UV-VIS spectroscopy was employed. This thesis explores the design, synthesis, and characterization of TDQ-based materials for diverse energy applications.