Synthesis of SF5-Aromatic Diazonium Salts for Building SF5-Bearing Molecules

Opportunity

The University of North Florida is seeking companies interested in commercializing new synthetic methods for the preparation of pentafluorosulfanyl (SF5) aromatic diazonium salts and the application of such salts as building blocks for a wide variety of compounds useful in biomedical, pharmaceutical, agricultural, and materials applications. The new methods developed at the University of North Florida facilitate access to a wide variety of SF5-aromatic compounds whose synthesis by other means is challenging and not economical due to their reliance on exotic/hazardous reagents and harsh conditions.

Application

SF5-bearing molecules have important biological properties and are of current interest in a wide variety of fields. The development of synthetic methods in this invention enable facile access to novel SF5-aromatics and to a large assortment of SF5-bearing molecules for use in high-performance polymers, liquid crystals, pharmaceuticals, and pesticides, areas that are highly dependent on the availability of these small molecule building blocks for producing functional compounds.

Invention Details

Compounds in the pentafluorosulfanyl (SF5) group impart a number of favorable physical and chemical characteristics including thermal, hydrolytic, and chemical stability, high density, high electronegativity, and high lipophilicity. These favorable characteristics have prompted a high degree of interest in SF5-organics for practical applications in the biomedical, agricultural, and materials fields. This invention provides a versatile, readily available, and easily produced starting pentafluorosulfanyl-substituted compound for use in pentafluorosulfanyl-based synthesis. Specifically, the invention allows for the synthesis and isolation of 4-(pentafluorosulfanyl)benzenediazonium tetrafluoroborate salt, which can be further deployed in a wide assortment of reactions to form novel SF5-bearing alkenes, alkynes, and biaryl derivatives, demonstrating the broad utility of pentafluorosulfanyl diazonium salts as building blocks of SF5-aromatics.


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Advantages

- Provides access to SF5-aromatic building blocks known for stability and many other favorable properties.
- New method of synthesizing SF5-aromatics that is relatively inexpensive and environmentally friendly.
- Expands the library of SF5-aromatics for biomedical, pharmaceutical, and materials applications.