Tridentate and Tetradebate Gold (III) Complexes for Use as Phosphorescent Emitters
AzTE Case #M10-076P

Background

Gold complexes can be used as luminescent markers for bioapplications, emitters for organic light emitting diodes, as anticancer agents, and as absorbers for organic photovoltaics. For best performance of phosphorescent based OLEDs heavy metal complexes involving iridium(III), platinum(II), ruthenium(II) and gold(III) are used. Existing technologies are based on platinum(II) based complexes. Platinum is an extremely rare metal and is in great demand for a variety of applications. It is essential to find alternative materials in order to reduce cost and ease the supply chain demands of platinum.

Invention Description

Researchers at Arizona State University have designed and synthesized a new series of phosphorescent tridentate and tetradebate gold(III) complexes. The complex consists of a gold(III) atom coordinated with tridentate or tetradebate ligand. The tetradebate structure of the gold complex is unique. Modification of the ligand structure enables tuning of the emission energy, making the series suitable in electroluminescent devices. This invention is expected to improve the stability of the synthesized gold complexes and improve the spectral efficiency.

Potential Applications

• Solar Cells
• Luminescent labels
• Organic light emitting diodes
• Anticancer agents

Benefits and Advantages

• It is cost effective
• This invention creates a new set of gold centered organic materials
• Broadens the application space as the emission spectra of the synthesized materials can be tuned from ultraviolet to infrared regions
• Improved spectral efficiency
• Improved stability of the gold complexes