Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

1475 N. Scottsdale Road, Suite 200
Scottsdale, AZ 85287-3538
Phone: 480 884 1996 Fax: 480 884 1984

Case ID:M22-072P
Published: 8/4/2022

Inventors

Gary Moore

Contact

Physical Sciences Team

Binuclear Fe(III) Fused Porphyrin

-Potential Applications • Electron-conducting molecular wires • Electrocatalysis • Non-linear optical materials • Supramolecular chemistry Benefits and Advantages • Achieves twice the redox activity seen in mononuclear porphyrin • Bimetallic-iron sites • Capable of delocalizing electrons across the multimetallic scaffold • Can store up to six electrons Invention Description Research at Arizona State University has resulted in the synthesis of a novel binuclear Fe(III) fused porphyrin. Ultraviolet-visible spectroscopy confirms the extended electronic structure of this macrocycle. In addition, Fourier transform infrared spectroscopy indicates the Fe centers experience a relatively rigid ligand environment as compared to a structurally related mononuclear complex featuring an 18 π-aromatic porphyrin ligand. X-ray photoelectron and X-ray absorption near edge spectroscopies confirm the presence of Fe(III) centers in the as-prepared resting state. In comparison with the mononuclear porphyrin, electrochemical measurements show there is a doubling of the number of redox events associated with the fused binuclear complex. Related Publication: Six-Electron Chemistry of a Binuclear Fe(III) Fused PorphyrinResearch Laboratory of Professor Gary Moore