Luminescent Gold(I)-Thallium(I) Arrays through N-Bidentate Building Blocks

Eduardo J. Fernández[a], Peter G. Jones[b], Antonio Laguna[c], José M. López-de-Luzuriaga[a], Miguel Monge[a], Manuel Montiel[a], M. Elena Olmos[a], and Javier Pérez[a]

[a] Departamento de Química, Universidad de La Rioja, Grupo de Síntesis Química de La Rioja, UA-CSIC. Complejo Científico-Tecnológico, 26004-Logroño, Spain
[b] Institut für Anorganische und Analytische Chemie der Technischen Universität, Postfach 3329, D-38023 Braunschweig, Germany
[c] Departamento de Química Inorgánica, Instituto de Ciencia de Materiales de Aragón, Universidad de Zaragoza-CSIC, 50009-Zaragoza, Spain

Reprint requests to Prof A. Laguna. E-mail: alaguna@posta.unizar.es or to Dr. E. J. Fernández. E-mail: eduardo.fernandez@dq.unirioja.es

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Heteropolynuclear gold(I)-thallium(I) complexes of the type $[TlL_n][Au(C_6F_5)_2]$ (L = py (**2**), 2,2'-bipy (**3**), 1,10-phen (**4**) or 4,4'-bipy and THF (**5**); $n = 1, 2$) have been obtained from reactions of the corresponding N-donor ligands with the precursor $\{Tl[Au(C_6F_5)_2]\}_n$ (**1**). The crystal structures of complexes **3** – **5** have been determined by X-ray diffraction showing one- (**3**, **4**) or three-dimensional (**5**) arrays. All complexes are photoluminescent in the solid state at RT and at 77 K. The strong visible emissions of complexes **2** – **5** are displayed over a wide range of wavelengths (460 – 620 nm) depending on the environment of the thallium(I) centres and on the nature of the N-donor ligand.

Key words: Gold, Thallium, N-Donor Ligands, Luminescence