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## Tetra (4-propargyloxyphenoxy) phthalocyanines: Facile synthesis, fluorescence and thermal properties

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The facile method of synthesizing terminal alkynyl (C=C) functionalized metal tetra (4-propargyloxy phenoxy) phthalocyanines (MTPrOPhOPc) is reported. The synthesized complexes are the metal-free (H<sub>2</sub>TPrOPhOPc), cobalt (CoTPrOPhOPc) and manganese (Mn(OAc)TPrOPhOPc) phthalocyanines as shown in Figure 1. Phthalocyanines' interesting properties have motivated their wide industrial applications such as building blocks in medicinal applications as photosensitizers, electrocatalysts in chemical sensors, liquid crystals, nonlinear optical materials and molecular devices. This work investigated the use of propargyl bromide to achieve the 4-(4-propargyloxy)phenoxy functionalised phthalocyanine complexes. The fluorescence lifetimes for the H<sub>2</sub>TPrOPhOPc and Mn(OAc)TPrOPhOPc, evaluated using time correlated single photon counting (TCSPC) technique, were found to be 5.79 ns and 5.50 ns, respectively. The correlation lifetimes were also investigated and found to be 0.74 ns and 0.71 ns for H<sub>2</sub>TPrOPhOPc and Mn(OAc)TPrOPhOPc, respectively. The CoTPrOPhOPc and Mn(OAc)TPrOPhOPc exhibited excellent thermal stability, which was better than H<sub>2</sub>TPrOPhOPc, due to the presence of the cobalt and manganese metal ions at the centre of the phthalocyanine ring. Density functional theory (DFT) calculations predicted the HOMO-LUMO (lowest unoccupied molecular orbitals) gap of H<sub>2</sub>TPrOPhOPc, CoTPrOPhOPc and Mn(OAc)TPrOPhOPc to be 2.06 eV, 2.15 eV and 1.75 eV respectively.

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