Poster

Rad(ical) Naphthalimide-Based Coordination Polymers

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New applications for porous coordination polymers (CPs) are continuously emerging due to their tuneable pore size, selectivity, and metal activity. CPs have been investigated for their wide range of properties, like magnetism. Naphthalenediimides (NDIs) are chemically robust and electron deficient ligands. They are very versatile due to the amenability of the NDI core to functionalisation through the diimide nitrogen sites [1, 2]. NDI derivatives are of high interest not only because they can be used to form CPs with varied structures and topologies, but they also possess many interesting features like easy reduction into radical anions, redox-activity, n-type semiconductivity, and photochromism. The NDI radical form can be accessed via in situ electrochemistry as well as photo- irradiation.2 Radical/magnetic CPs would be of particular interest for the synthesis of multifunctional materials with applications ranging from gas separation [3] to erasable printing [4].

Three novel porous CPs have been constructed using two NDI-derived ligands, namely N,N′-bis(5-isophthalic acid)naphthalenediimide (BIPA-NDI) and N,N′-di(4-pyridyl)-naphthalenediimide (BP-NDI) (Figure 1 (a)) and different metal cations. Two of the CPs contain copper and zinc metal centres and form two-dimensional microporous frameworks and the third contains a bismuth metal centre and forms a three-dimensional porous framework with a wine rack architecture (Figure 1 (b), (c), and (d), respectively). The CPs exhibit photochromism to varying degrees and will be investigated for their optical and magnetic properties.

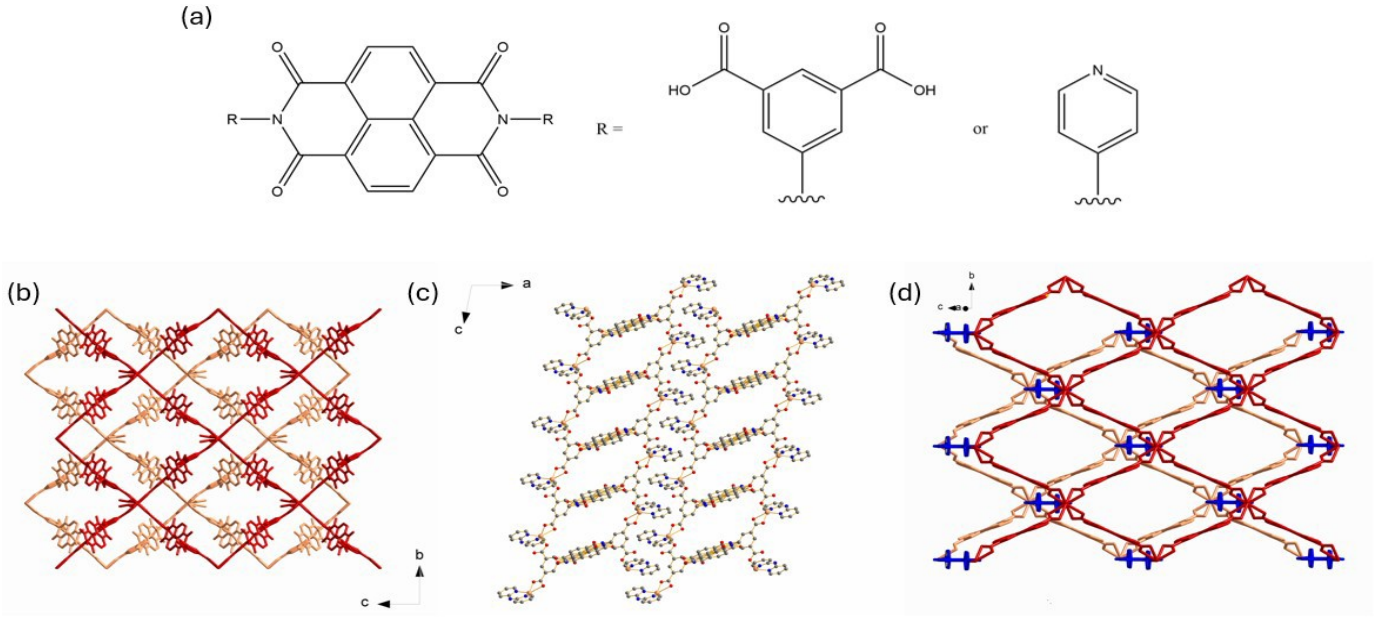

Figure 1. (a) General structure of a naphthalenediimide (NDI) derived ligand, where R = BIPA-NDI or BP-NDI, (b)) 2D sheets of the copper CP viewed along the a-axis, (c)) 2D sheets of the zinc CP viewed along the b-axis, and (d) a simplified view of the 3D superstructure of the bismuth CP. Hydrogen atoms and solvent guests/counterions omitted for clarity.

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[3] Nguyen H. T. D., Tran Y.B.N., Nguyen H. N., Nguyen T. C., Gándara F. & Nguyen P. T. K. (2018) *Inorg. Chem.*, **57**, 13772–13782.

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