Public Abstract

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***“ANION AND SOLVENT INFLUENCES
ON THE SELF ASSEMBLY OF COPPER(I)
COORDINATION SOLIDS”***

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advisor's signature

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The synthesis of hybrid, metal-organic porous solids has led to the identification of anion and solvent dependence on the solids development process. Subtle variations of either of these species has profound effects on the nature of the of the final products porous network. Because the functionality of porous solids is directly related to the composition and structure of their porous networks, understanding ways to control the design of the structure is an important feature in the development of useful porous solids. This study looks at various types of syntheses in detail in order to get a better understanding of what influences the anion and solvent have in these reactions. It also investigates the processes leading up to the final product by studying synthetic intermediate compounds in order to construct a synthesis mechanism that directs each reaction to a specific final product. In the later half of this study, instances of anion-templated structures are identified, some of which lead to the discovery of a large cavity porous solid. The functionality of this new solid is presented in a demonstration of anion exchange, in which the radioactive pertechnetate anion is selectively removed from a solution in the presence of other competing anions. This study should be beneficial for the advancement of materials development by providing the synthetic chemist the means to develop new porous solids by rational design.