

Synthesis and antibacterial activity of bimetallic carboxyphosphonates

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As a class of coordination polymers (CPs), metal phosphonates (MPs) are constructed by coordination bonds connecting metal sites and phosphonate (RPO_3^{2-}) ligands, where the metal sites are dispersed uniformly at the atomic level. The synthetic chemistry of phosphonates is well developed, so phosphonic acids can be obtained through simple, well-known reactions, enabling the synthesis of phosphonate derivatives of non-steroidal anti-inflammatory drugs (NSAIDs) to be carried out. [1, 2]

We report here, general characteristics of a new series of isostructural compounds resulting from the combination of the multifunctional R,S-hydroxyphosphonoacetic acid (HPAA) with transition metal ions, $\text{AgM}^{\text{II}}[\text{HO}_3\text{PCH}(\text{OH})\text{COO}]$ ($\text{M}^{\text{II}} = \text{Co}$ or Zn), AgMHPAA . Both compounds were synthesized under hydrothermal conditions and their crystal structures were solved from single crystal diffraction data.

The antibacterial activity of AgZnHPAA and AgCoHPAA was evaluated using three different bacterial strains: *Staphylococcus aureus* (NCIMB 6571), *Escherichia coli* K12 W-T (W1485 Cardiff Collection) and *Pseudomonas aeruginosa* (NCIMB 8295). Preliminary results regarding their antibacterial properties will be presented and discussed.

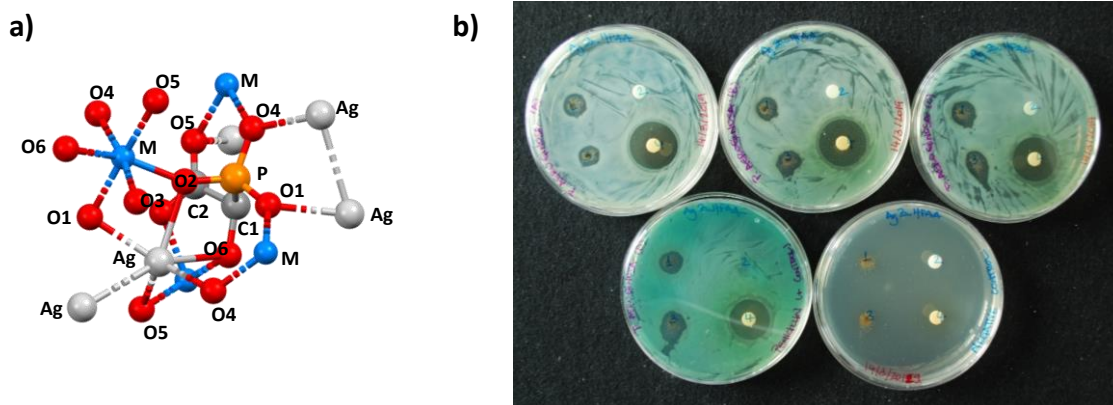


Figure 1. a) Asymmetric unit of $\text{AgM}^{\text{II}}[\text{HO}_3\text{PCH}(\text{OH})\text{COO}]$ ($\text{M}^{\text{II}} = \text{Co}$ or Zn); b) *Pseudomonas aeruginosa* inhibition zone for AgZnHPAA .

References

- [1] Clearfield, A., Demadis, K.D., in *Metal Phosphonate Chemistry: From Synthesis to Applications*, Eds. RSC: Cambridge, U.K., 2011.
- [2] Rueff, J.-R., Perez, O., Caignaert, V., Hix, G., Berchel, M., Quentel, F., Jaffrès, P.-A., *Inorg. Chem.* 2015, 54, 2152–2159.