

ESTABLISHMENT:

Laboratory(ies) of affiliation: UCCS – UMR 8181

Scientific field, Speciality:

 **DS4 | Materials chemistry**

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Title of the thesis: A modular approach for the synthesis of coordination networks containing niobium and tantalum cations

THESIS SUBJECT (ABOUT 1/2 PAGE)

In this proposal, we wish to design new compounds based on tantalum (V) or niobium (IV and V) obtained by using oxo-donor ligands of the (poly)-carboxylate or (poly)-phosphonate type to form molecular systems or coordination polymers (PC) for catalytic purposes (Fig. 1).

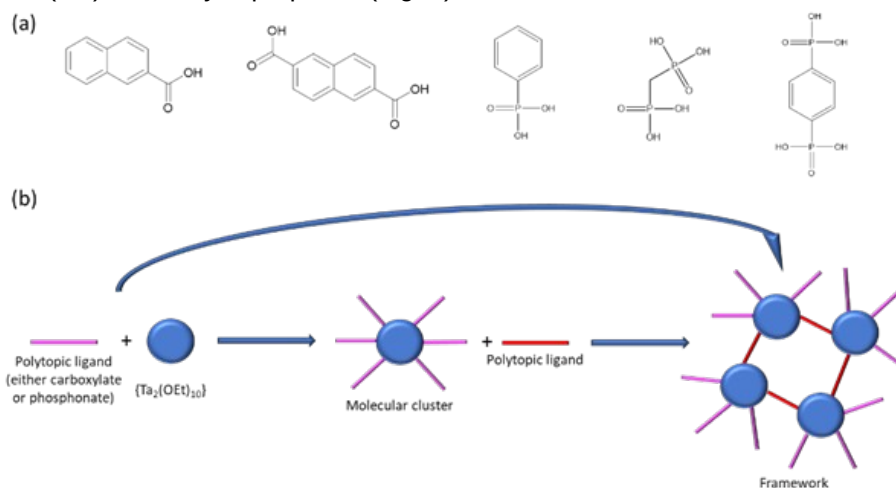


Fig.1: (a) Ligand examples and (b) proposed synthetic pathway for the materials

Such materials (based on the aforementioned elements niobium and tantalum) are rarely reported or even non-existent in the literature and will constitute a new family of compounds of undeniable fundamental interest. The introduction of this new family of heterogeneous acid catalysts remains a necessity to increase the viability of transformations involving the valorization of biosourced substrates in the aqueous phase. Usually, phosphonate-based compounds exhibit greater stability and their degradation leads to the formation of analogues of inorganic phosphate materials such as MOPO_4 ($M = \text{Nb}, \text{Ta}$) which have shown real interest in the transformations of biosourced products into “platform” molecules for the chemical industry.



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Additional remarks/comments: