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## **COFFRREW - High selective 2DCOFs for Resources Recovery from Electronic-Waste**

Recovery of precious and critical metals (Au, Nd) from e-waste not only has substantial economic and environmental advantages but also addresses the problem of resource scarcity. In this area, the adsorption approach is recognized as an efficient, facile, and green methodology. Recently, covalent organic frameworks (COFs) have emerged as potential adsorbents for metal recycling from waste materials. However, there are still key challenges that need to be addressed: (1) poor selectivity against interferents; (2) low uptake capacity; and (3) poor reusability in real leaching solutions. To address these issues, COFFRREW aims to develop sustainable and economically viable adsorbents for precious metal recovery from e-waste. To achieve these aims, a series of  $\beta$ -ketoenamine 2DCOFs (Tp-linked) will be synthesized using facile "solvothermal" chemical reactions. Then, pore-wall engineering with appropriate functional groups will follow to tune the selectivity and efficiency for targeted metal ions. This project will construct novel and tailor-made 2DCOF structures, which will produce exciting outcomes to resolve the problems of selectivity, uptake capacity, and reusability in the field of Au and Nd recovery using COFs. This project will study role of selective sites (such as thiol for  $\text{Au}^{3+}$ , long carboxyl arms for  $\text{Nd}^{3+}$ ) in the confined spaces of Tp-linked 2DCOFs for selective metal recovery from e-waste, and will fill the research gap by resolving the challenges in this field. This project is both interdisciplinary and multidisciplinary in nature. It will have significant social, economic, and scientific impacts, aligning with SDG Goals 8 and 13, the Green Deal Charter, and contributing to the enhancement of EU scientific excellence.

**UNIPD Supervisor:** Mauro Carraro

**MSCA Fellow:** Muhammad Faheem

**Department:** Chemical Sciences

**Coordinator:** Università degli Studi di Padova (Italy)

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