Title: Ultramicroporous coordination polymer for efficient ethylene separation

Abstract: The chemical separation process involves the purification and production of almost every raw material monomer in the chemical industry. Most of the traditional separation processes are based on the phase change process of the components to be separated. About 10-15% of the world's energy is used in industrial-related separation and purification processes each year, of which ethylene and propylene monomer alone account for 0.3%. Since it does not involve phase transition, the physical adsorption separation technology based on advanced porous materials can greatly reduce the energy consumption compared with traditional separation technology, coupled with the advantages of fast adsorption and desorption kinetics, low equipment cost and simple operation, which has attracted widespread attention from scientists around the world. At present, the vast majority of adsorption separation studies mainly focus on single-component adsorption or two-component mixture separation under ideal mixture models. Although considerable progress has been made under these ideal scenarios, the research on complex separation systems under the actual working conditions of related industrial processes needs to be further deepened. This talk will focus on the research progress of one-step efficient separation of ethylene from complex multi-component systems in three aspects: structure-oriented design of microporous coordination polymers, analysis of adsorption and separation mechanism, and synergistic sorbent separation technology of porous materials.

Bio: Kai-Jie Chen, Professor of School of Chemistry and Chemical Engineering, Northwestern Polytechnical University. His research is mainly engaged in the design, construction and application of porous separation materials. He currently serves as the deputy director of the Key Laboratory of Special Functional and Intelligent Polymer Materials of the Ministry of Industry and Information Technology, the deputy director of the Xi'an Key Laboratory of Functional Organic Porous Materials, and the deputy dean of the School of Chemistry and Chemical Engineering of Northwestern Polytechnical University. He has published more than 60 SCI papers on Science, JACS, Nat. Commun., Chem, Angew and other journals. He has presided over a number of national, provincial and ministerial scientific research projects, including National Overseas High-level Young Talents Program, National Natural Science Foundation Project, and Shaanxi University Youth Innovation Team.