# New progress in water purification achieved by a conjugated microporous polymer

With the support by the National Natural Science Foundation of China, Prof. Deng Weiqiao's group from Dalian Institute of Chemical Physics made progress in water treatment, using a newly synthesized perfluorous conjugated microporous polymer as an adsorbent, which was published in *Scientific Reports* (2015, 5: 10155).

More than one-third of the human population have access or only limited access to sanitary and safe drinking water. Oils, organic solvents, dyes, and heavy metal ions are primary pollutants in water resources. However, no sorbent material can effectively remove these types of pollutants simultaneously.

This perfluorous conjugated microporous polymer, with superhydrophobicity and a large surface area, exhibits outstanding adsorption capacities, kinetics, and recyclability for a wide range of organic solvents, oils, dyes, and heavy metal ions. The adsorption capacities of this polymer, 1376.7 mg $g^{-1}$ for Congo red, 808.2 mg $g^{-1}$ for Pb(II) and 303.2 mg $g^{-1}$ for As(V), are higher than that of any previously described porous material. The theoretical calculation revealed that the superior properties of this polymer are due to fluorination and triple bonds within the polymer. A benchmark experiment indicated that this polymer can efficiently remove these pollutants simultaneously. In addition, the used polymer can be recycled by a simple washing method. Application of this polymer may lead to the development of next-generation reusable and portable water purification appliances.

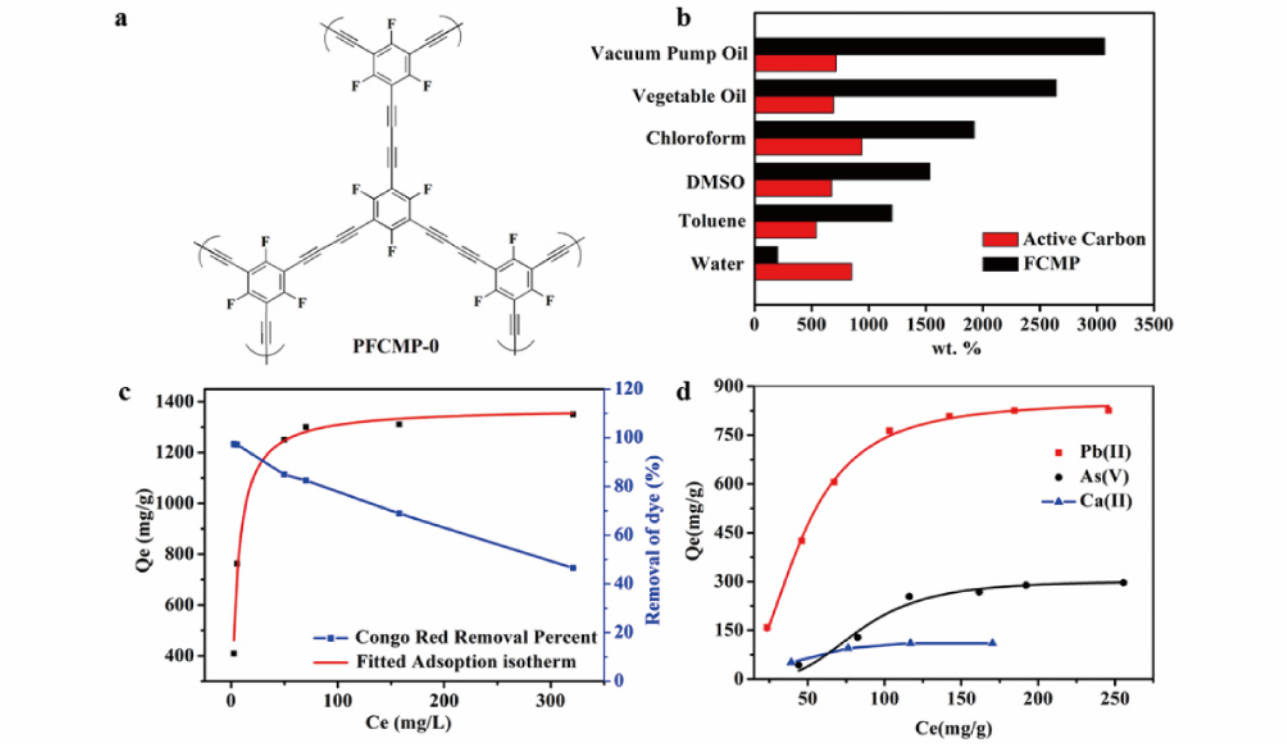


**Figure** (a) Structure of the perfluorous conjugated microporous polymer. (b) Adsorption capacities for different solvents and oils. (c) The adsorption isotherms and percentage removal of CR as a function of the equilibrium concentration. (d) Adsorption isotherms of metal ions.