The Features Of Medicinal Chemistry

The chemical building block (CBB) is a molecule which can be converted to various secondary chemicals and intermediates, and, in turn, into a broad range of different downstream uses. The organic building blocks assembly is an effective strategy to synthesize materials. Simple molecule structures such as tetrafluoroethylene (ETFE) is an universal and magical monomer that are widely used in the construction of high polymer materials and nonlinear optics materials. The simplicity of manufacture greatly promote their application in material industry due to the fact that organic building blocks are processable either as the starting materials or as a precursor. More importantly, the material's optical and electronic properties is tunable with the help of the large building block library as well as the enormous versatility of organic chemistry which has allowed the different applications in various areas.

Function-inspired design of molecular building blocks for their assembly into complex systems has been an objective in engineering nanostructures and materials modulation at nanoscale[1]. By identifying the appropriate molecular building blocks (monomers, and oli-gomers of arene or heteroarene back-bone) and employing different fabrication techniques, complex material systems can be produced with precise control over structure, properties, and functions. These building blocks are tailored in such a way as to achieve thermal and chemical stability, stimuli-responsiveness, photo-switchability, and electron-conductivity for perspective applications. Illustrating these customized building blocks, special focus is given to their assembly for the construction of various covalent/noncovalent structures including porous crystalline networks such as metal/covalent–organic frameworks (MOFs/COFs)

MOF crystal chemistry offers the potential to introduce desired properties and functionality prior to the assembly process by preselecting building blocks to contain desired structural and geometrical information that codes for a given underlying net[2]. The assembly process, referred to as the molecular building block (MBB) approach, permits access to MOFs with simple topologies, such as edge-transitive nets (nets with one kind of edge). What’s more, such complex and elaborate building blocks can be designed and attained as supermolecular building blocks (SBBs), larger building units based on the assembly of relatively simple and readily accessible building blocks. Utilization of these SBBs with a high degree of symmetry and connectivity, as well as the needed elaborate directional and structural information, permits access to novel MOF platforms.

References

1. Assembly of Molecular Building Blocks into Integrated Complex Functional Molecular Systems: Structuring Matter Made to Order. Adv. Funct. Mater. 2020, 1907625.
2. A supermolecular building approach for the design and construction of metal–organic frameworks. Chem. Soc. Rev., 2014, 43, 6141