



Demystifying the Importance of Molecular Catalysis



Molecular catalysis involves using catalyst molecules to accelerate chemical reactions without being consumed, playing a critical role in industries like chemical manufacturing, pharmaceuticals, and fuel production. By reducing activation energy, catalysts improve reaction efficiency, lower energy consumption, and minimize environmental impact. Molecular catalysts include homogeneous (same phase as reactants) and heterogeneous (different phase) types, with enzymes and transition metal complexes like ruthenium and palladium being key examples. Recent developments focus on enhancing sustainability, such as designing catalysts for CO₂ reduction into fuels, selective oxidation of hydrocarbons using Metal-Organic Frameworks (MOFs), and biomass conversion into biofuels. These advancements address critical challenges in energy, environment, and industrial efficiency.

<https://www.chemicalindustryreview.com/news/demystifying-the-importance-of-molecular-catalysis-nwid-346.html>