Catalysts significantly alter reaction rates without being reactants or products, operating as biochemical enzymes essential for life or man-made solids crucial for over 50% of industrial chemical production. While speeding reactions, their key attribute is selectivity, changing only specific reaction rates. Catalyst action is complex; activity relates to physical surface structure, not just chemical constitution. Theories suggest catalysts form intermediates on their surface, influence molecules near it, or generate free radicals. Fundamentally, catalysts reduce the potential energy barrier (activation energy) for reactions, increasing rates without affecting equilibrium. Desirable catalysts possess large, accessible surface .areas

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