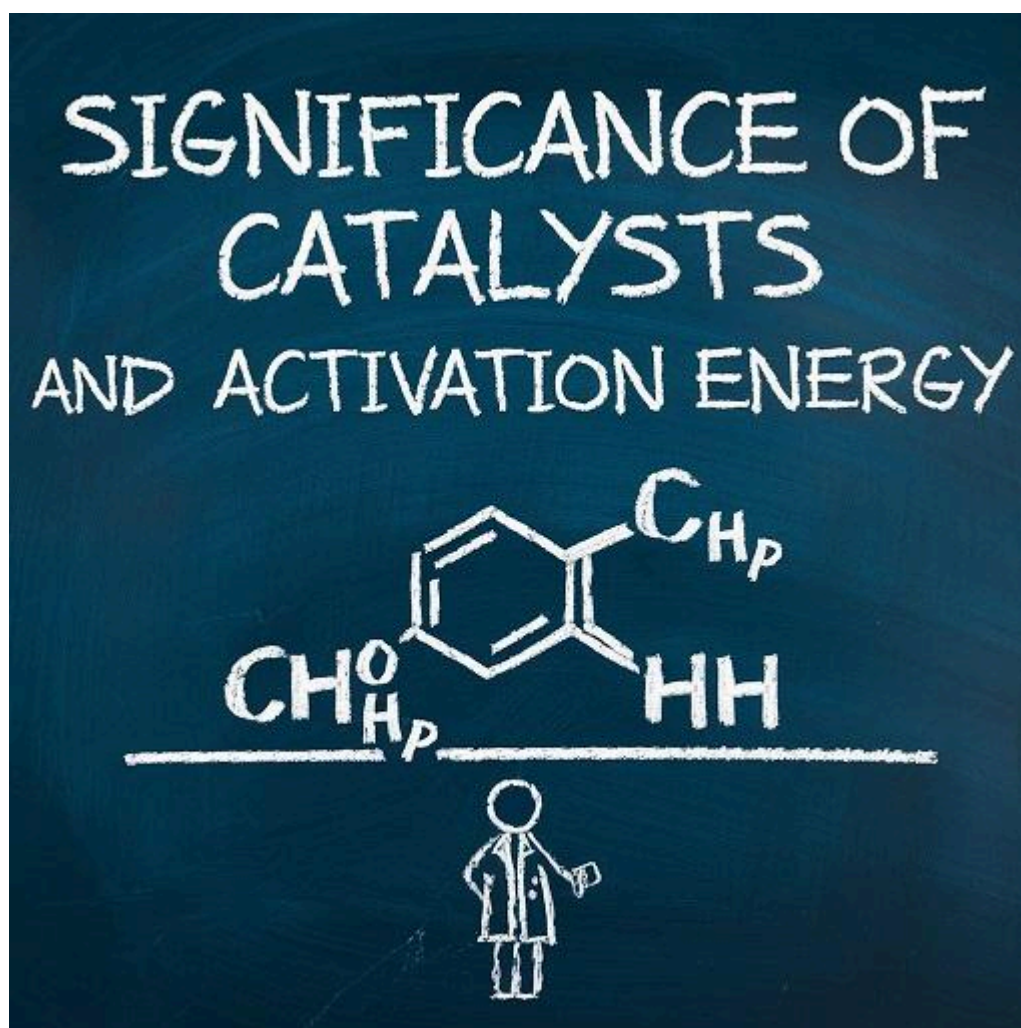




Significance of Catalysts and Activation Energy



Catalysts are substances that accelerate chemical reactions without being consumed, destroyed, or permanently altered. By lowering the activation energy—the minimum energy required for a reaction to occur—catalysts provide an alternative reaction pathway, enabling faster and more efficient processes. They are crucial in both natural and industrial settings, from enzymes facilitating metabolic activities in living organisms to industrial catalysts used in producing plastics, fuels, and pharmaceuticals. Catalysts do not alter the net energy change between reactants and products but improve the reaction mechanism, maintaining stability and reusability. Examples include iron as a catalyst in ammonia synthesis and aluminum-chromium oxide for ethylene production. By reducing energy input, catalysts contribute to minimizing greenhouse gas emissions and lowering the carbon footprint of chemical processes, playing a vital role in advancing sustainable and efficient industrial operations.

<https://www.chemicalindustryreview.com/news/significance-of-catalysts-and-activation-energy-nwid-129.html>