

Name \_\_\_\_\_

## What Is The Role Of Catalysts And Enzymes In Speeding Up Reactions?

### Open-Ended Response Answer Key

1. Catalytic converters in automobiles play a vital role in reducing air pollution by transforming harmful exhaust gases like carbon monoxide and nitrogen oxides into less harmful substances. However, they face challenges such as the limited availability of precious metals like platinum and palladium used as catalysts.
2. Enzymes in living organisms have diverse roles, from DNA replication (DNA polymerase) to digestion (amylase, protease) and blood clotting (thrombin). Each enzyme is specific to its function and plays a crucial role in maintaining life processes.
3. Enzymes are instrumental in biotechnology research, enabling DNA analysis, protein production, and the development of therapeutic medications like insulin. Their specificity and efficiency make them invaluable tools in scientific advancements.
4. Catalysts and enzymes have the potential to address global challenges by improving the efficiency of clean energy production, reducing environmental pollution, and enabling sustainable chemical processes. Their applications extend to areas such as catalytic water splitting for hydrogen production and enzymatic biodegradation of plastic waste.

