Review Article   **Published Date:-2024-03-11 12:44:20**

[Methodology for Studying Combustion of Solid Rocket Propellants using Artificial Neural Networks](#)

The combustion properties of energetic materials have been extensively studied in the scientific literature. With the rapid advancement of data science and artificial intelligence techniques, predicting the performance of solid rocket propellants (SRPs) has become a key focus for researchers globally. Understanding and forecasting the characteristics of SRPs are crucial for analyzing and modeling combustion mechanisms, leading to the development of cutting-edge energetic materials. This study presents a methodology utilizing artificial neural networks (ANN) to create multifactor computational models (MCM) for predicting the burning rate of solid propellants. These models, based on existing burning rate data, can solve direct and inverse tasks, as well as conduct virtual experiments. The objective functions of the models focus on burning rate (direct tasks) and pressure (inverse tasks). This research lays the foundation for developing generalized combustion models to forecast the effects of various catalysts on a range of SRPs. Furthermore, this work represents a new direction in combustion science, contributing to the creation of a High-Energetic Materials Genome that accelerates the development of advanced propellants.