

A Comprehensive Analysis of the Surge in Lithium Battery-Related Fires with Leveraging Machine Learning

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This research paper explores the increasing surge in lithium battery-related fires, particularly those involving electric vehicles (EVs) and lithium-ion batteries, presents a pressing safety concern that demands urgent attention. While EVs are lauded for their potential to significantly reduce carbon emissions and support sustainable transportation, the growing occurrence of battery fires underscores significant risks to public safety. This research provides a comprehensive analysis of the surge in lithium battery-related fires, with a specific focus on EVs and lithium-ion batteries. Through the utilization of classification, clustering, and data visualization methodologies, the study aims to identify underlying techniques, and seeks to uncover underlying patterns and emerging trends linked to incidents. Furthermore, the research investigates the effectiveness of existing safety measures and protocols in mitigating fire risks, while also proposing evidence-based recommendations for enhancing fire prevention, emergency response, and public awareness initiatives.

Keywords: *Lithium battery-related fires, Electric Vehicles (EVs), Lithium-ion batteries, sustainable transportation, risk assessment, clustering, classification*