# Article information:

Lithium-ion battery aging mechanisms and diagnosis method for automotive applications: Recent advances and perspectives - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S1364032120303397?via%3Dihub=>

# Article summary:

1. Lithium-ion batteries decay over time due to aging-induced degradation.

2. The aging mechanisms of lithium-ion batteries are manifold and complicated, strongly linked to many interactive factors such as battery types, electrochemical reaction stages, and operating conditions.

3. Three widely-used methods for diagnosing battery aging include disassembly-based post-mortem analysis, curve-based analysis, and model-based analysis.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article "Lithium-ion battery aging mechanisms and diagnosis method for automotive applications: Recent advances and perspectives" provides a comprehensive overview of the aging mechanisms and diagnosis methods of lithium-ion batteries. The article is well-structured, with clear headings and subheadings that make it easy to follow. The authors provide a detailed description of the various aging reactions that occur inside the battery during storage and cycling, as well as the different external factors that can influence these reactions.

One potential bias in the article is its focus on lithium-ion batteries, which are presented as superior to other types of batteries. While it is true that lithium-ion batteries have many advantages, such as high working voltage, high specific energy, and long cycle life, it would be useful to acknowledge their limitations and potential risks. For example, lithium-ion batteries can be prone to thermal runaway and fire if they are damaged or overcharged.

Another potential bias in the article is its emphasis on quantitative analysis methods for diagnosing battery aging. While these methods are undoubtedly important for accurately assessing battery health, they may not always be practical or feasible in real-world applications. It would be useful to explore non-destructive ex-situ analysis methods in more detail, as these may be more suitable for on-board diagnosis.

The article does a good job of presenting both sides of the debate around SEI film formation at the anode/electrolyte interface. While some researchers argue that SEI film formation is necessary for stable battery operation, others suggest that it can lead to capacity loss and reduced cycle life. However, there could be more discussion around potential counterarguments to each perspective.

Overall, "Lithium-ion battery aging mechanisms and diagnosis method for automotive applications: Recent advances and perspectives" provides a valuable overview of an important topic in battery research. While there are some potential biases in the article, these do not detract significantly from its overall usefulness.

# Topics for further research:

* Limitations and risks of lithium-ion batteries
* Thermal runaway and fire in lithium-ion batteries
* Other types of batteries and their advantages/disadvantages
* Non-destructive ex-situ analysis methods for battery diagnosis
* Counterarguments to SEI film formation perspectives
* Real-world feasibility of quantitative analysis methods for battery diagnosis

# Report location:

<https://www.fullpicture.app/item/cc402c49f58ab63e30cc5c473cad16b6>