# Article information:

Achieving Desirable Initial Coulombic Efficiencies and Full Capacity Utilization of Li‐Ion Batteries by Chemical Prelithiation of Graphite Anode - Shen - 2021 - Advanced Functional Materials - Wiley Online Library  
<https://onlinelibrary.wiley.com/doi/full/10.1002/adfm.202101181>

# Article summary:

1. Graphite is the most commonly used anode in lithium-ion batteries, but its low initial Coulombic efficiency (ICE) and capacity utilization limit their potential.

2. Various strategies have been suggested to improve the ICE of graphite anode, including prelithiation with metallic Li or electrochemical prelithiation.

3. A new chemical prelithiation solution, lithium biphenylide/2-methyl tetrahydrofuran (Li–Biph/2-Me-THF), has been developed which demonstrated an extremely low redox potential and improved the ICE and CE of LIBs.

# 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 is generally reliable and trustworthy as it provides a comprehensive overview of the current state-of-the-art lithium-ion batteries (LIBs) and strategies to improve their energy utilization and cycling efficiency (CE). The article also presents a novel chemical prelithiation solution, lithium biphenylide/2-methyl tetrahydrofuran (Li–Biph/2-Me-THF), which has been successfully developed to improve the ICE and CE of LIBs. The article is well researched with references to relevant literature throughout, providing evidence for the claims made.

However, there are some points that could be further explored in order to provide a more balanced view of the topic. For example, while the article mentions various strategies for improving the ICE of graphite anode such as prelithiation with metallic Li or electrochemical prelithiation, it does not provide any details on these methods or discuss their advantages or disadvantages compared to chemical prelithiation. Additionally, while the article discusses possible safety hazards associated with using SLMP for prelithiating Gr anode, it does not mention any potential risks associated with using Li–Biph/2-Me-THF solution for chemical prelithiation. Furthermore, while the article mentions that organic ethers are incompatible with graphite anode due to co-intercalation reaction during prelithiation process, it does not discuss whether this is also true for Li–Biph/2-Me-THF solution or if there are any other potential risks associated with this method.

In conclusion, while overall reliable and trustworthy, this article could benefit from further exploration into other strategies for improving graphite anodes’ ICE as well as discussing potential risks associated with using Li–Biph/2-Me-THF solution for chemical prelithiation in order to provide a more balanced view of the topic.

# Topics for further research:

* Advantages and disadvantages of metallic Li prelithiation
* Safety hazards of SLMP prelithiation
* Risks of Li–Biph/2-Me-THF prelithiation
* Co-intercalation reaction with organic ethers
* Alternative strategies for improving graphite anode ICE
* Li–Biph/2-Me-THF compatibility with graphite anode

# Report location:

<https://www.fullpicture.app/item/f26fe63de2964d97d71d5f7bb4df1eaa>