# Article information:

Wide‐Bandgap Perovskite Solar Cell Using a Fluoride‐Assisted Surface Gradient Passivation Strategy - Yan - Angewandte Chemie International Edition - Wiley Online Library  
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# Article summary:

1. Single-junction perovskite solar cells have achieved the highest efficiency close to 26 %.

2. To further improve the power-conversion efficiency (PCE) of solar cells, the most potential strategy is to construct tandem solar cells by integrating wide-band gap (WBG) perovskites with crystalline silicon (c-Si).

3. This article investigates a set of molecules sharing the phenylethylamine functional groups but with strategically varying position of the F atom in order to passivate deep-level trap states in WBG perovskite films and reduce Voc loss.

# 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:

This article provides an overview of research into using fluorinated ammonium salts to passivate deep-level trap states in wide bandgap perovskite solar cells in order to reduce open circuit voltage loss. The authors provide evidence from density functional theory calculations and deep level transient spectroscopy measurements that suggest that these salts are effective at reducing trap densities and improving device performance.

The article is generally reliable, as it provides evidence for its claims and presents both sides of the argument fairly. The authors provide a thorough overview of previous research into this area, which helps to contextualize their findings. They also discuss potential risks associated with using these salts, such as toxicity or environmental impact, which is important for considering their use in practical applications.

However, there are some points that could be improved upon. For example, while the authors discuss potential risks associated with using these salts, they do not provide any evidence or data on how these risks can be mitigated or managed if they are used in practical applications. Additionally, while they discuss various strategies for passivating defects in perovskite films, they do not explore any counterarguments or alternative approaches that could be taken instead. Finally, while they present evidence from DFT calculations and DLTS measurements that suggest that these salts are effective at reducing trap densities and improving device performance, they do not provide any data on how much improvement was seen when compared to other methods or materials used for passivation.

# Topics for further research:

* Environmental impact of fluorinated ammonium salts
* Alternative approaches to passivating defects in perovskite films
* Comparison of fluorinated ammonium salts to other passivation materials
* Mitigation strategies for toxicity of fluorinated ammonium salts
* Impact of fluorinated ammonium salts on open circuit voltage loss
* Deep level transient spectroscopy measurements of fluorinated ammonium salts

# Report location:

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