# Article information:

Fine Multi‐Phase Alignments in 2D Perovskite Solar Cells with Efficiency over 17% via Slow Post‐Annealing - Wu - 2019 - Advanced Materials - Wiley Online Library
<https://onlinelibrary.wiley.com/doi/full/10.1002/adma.201903889>

# Article summary:

1. A slow post-annealing (SPA) process has been proposed for BA2MA3Pb4I13 (n = 4) 2D perovskite solar cells, resulting in a champion PCE of 17.26%.

2. Investigation with optical spectroscopy and structural analyses indicates that enhanced crystal orientation and favorable alignment on the multiple perovskite phases is obtained with SPA treatment, which promotes carrier transport/extraction and suppresses Shockley–Read–Hall charge recombination in the solar cell.

3. The SPA-processed devices exhibit a satisfactory stability with <4.5% degradation after 2000 h under N2 environment without encapsulation.

# 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 “Fine Multi‐Phase Alignments in 2D Perovskite Solar Cells with Efficiency over 17% via Slow Post‐Annealing” by Wu et al., published in Advanced Materials in 2019, presents an innovative approach to improving the efficiency of 2D perovskite solar cells (PSCs). The authors propose a slow post-annealing (SPA) process for BA2MA3Pb4I13 (n = 4) 2D PSCs, which results in a champion PCE of 17.26%. The article is well written and provides detailed information about the research conducted by the authors, including optical spectroscopy coupled with structural analyses to investigate the effects of SPA treatment on crystal orientation and phase alignment, as well as transient electrical measurements to assess charge transport/extraction and SRH recombination losses.

The article is generally reliable and trustworthy; however, there are some potential biases that should be noted. For example, while the authors provide evidence for their claims regarding improved efficiency due to SPA treatment, they do not explore any counterarguments or alternative explanations for their findings. Additionally, while they note that their results are promising for realistic photovoltaic applications, they do not discuss any potential risks associated with this technology or its implementation. Furthermore, while they mention other studies related to 2D PSCs based on BA organic spacers (n = 4), they do not present both sides equally or explore any unexplored counterarguments from these studies.

In conclusion, this article provides an interesting approach to improving the efficiency of 2D PSCs; however, it does have some potential biases that should be noted when considering its trustworthiness and reliability.

# Topics for further research:

* Alternative explanations for 2D PSC efficiency
* Risks associated with 2D PSC technology
* Counterarguments from other studies on 2D PSCs
* Realistic photovoltaic applications of 2D PSCs
* Charge transport/extraction in 2D PSCs
* SRH recombination losses in 2D PSCs

# Report location:

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