Journal of Materials Chemistry A

RETRACTION

Cite this: DOI: 10.1039/d6ta90109c

Retraction: Convolutional neural network prediction of the photocurrent–voltage curve directly from scanning electron microscopy images

Yuta Hayashi, Yuya Nagai, Zhenhua Pan and Kenji Katayama*

DOI: 10.1039/d6ta90109c

rsc.li/materials-a

Retraction of 'Convolutional neural network prediction of the photocurrent–voltage curve directly from scanning electron microscopy images' by Yuta Hayashi *et al.*, *J. Mater. Chem. A*, 2023, **11**, 22522–22532, https://doi.org/10.1039/D3TA05282F.

We, the named authors, hereby wholly retract this *Journal of Materials Chemistry A* article. After publication, we carefully re-examined our machine-learning workflow and identified a serious methodological issue in the data augmentation and training process. Specifically, during image splitting and preprocessing, SEM images were split into small images and used for training and test datasets for machine learning. During the process, the images for the same sample were used for the training and test datasets. The convolutional neural network inadvertently learned sample-specific statistical features (such as the average intensity and standard deviation) that can be controlled by human-operation by adjusting the brightness and contrast. As a result, the prediction accuracy was substantially enhanced by non-physical, non-chemical information rather than by intrinsic structural features of the material system. Because this effect directly affects the validity of the reported prediction performance and the physical interpretation of the results, we conclude that the main conclusions of the paper cannot be considered reliable in their present form.

This issue was unintentional and only became evident through subsequent, more detailed methodological analysis. All co-authors have been informed of this problem and agree that the appropriate course of action is to retract the paper.

We sincerely regret any inconvenience caused to the journal and its readers and wish to proceed transparently and responsibly.

Signed: Yuta Hayashi, Yuya Nagai, Zhenhua Pan, Kenji Katayama, 11th February 2026

Retraction endorsed by Michaela Muehlberg, Executive Editor, *Journal of Materials Chemistry A*

Department of Applied Chemistry, Chuo University, Tokyo 112-8551, Japan. E-mail: kkata@kc.chuo-u.ac.jp; Tel: +81-3-3817-1913