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Retraction: Monodisperse CuB₂₃ nanoparticles grown on graphene as highly efficient catalysts for unactivated alkyl halide Heck coupling and levulinic acid hydrogenation

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Retraction of 'Monodisperse CuB₂₃ nanoparticles grown on graphene as highly efficient catalysts for unactivated alkyl halide Heck coupling and levulinic acid hydrogenation' by Shi Yan Fu *et al.*, *Catal. Sci. Technol.*, 2015, 5, 1638–1649.

The Royal Society of Chemistry hereby wholly retracts this *Catalysis Science & Technology* article, with the agreement of the authors, due to concerns with the reliability of the electron microscope (EM) and XRD images in the published article.

Two identical sections of particles, which have been rotated, can be observed in the STEM image in Fig. 1a.

The STEM images in Fig. S3a and S3b share a common motif of particles. A number of repeating sections of particles can also be observed in Fig. S3b.

The STEM image in Fig. S24b represents a magnified version of the same image presented in Fig. S1b.

The STEM image in Fig. S25a consists of two identical sections that have been rotated.

The XRD spectra in Fig. S22a–c are identical in the 2–37 and 72–80 degree ranges. Spectra b and c are also identical in the 46–72 degree range and contain a repeating pattern in the baseline.

The authors informed us that the characterisation was completed by a third party company and they used the images “without any editing or modification”. The authors repeated the experiments and requested to provide replacement data for Fig. 1a, S1b, S3, S22, S24b and S25a. The new figures were reviewed by an independent expert. The authors believe that the scientific content and conclusions of the related studies presented by the pictures in the published paper can be reproduced. However, the independent expert still questions the reliability of the published images. The authors informed us that due to a flooding accident in the laboratory, the original data of the published EM images were destroyed. In addition, the third party company only saved the test data for one month. Due to the large number of images, it is not possible to replace the published images with the new figures. To avoid the possibility of publishing unreliable EM images, the authors agree to retract this paper to protect the rigor of the scientific record.

This retraction supersedes the information provided in the Expression of Concern related to this article.

Signed: Dr Dong Ge Tong (on behalf of the authors).

Date: 1st August 2019.

Retraction endorsed by Anna Simpson, Executive Editor, *Catalysis Science & Technology*.

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