AUTHOR CORRECTION OPEN

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Author Correction: Three-dimensional strain imaging of irradiated chromium using multi-reflection Bragg coherent diffraction

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npj Materials Degradation (2023)7:54 ; https://doi.org/10.1038/s41529-023-00375-0

Correction to: *npj Materials Degradation* https://doi.org/10.1038/s41529-022-00311-8, published online 22 December 2022

The original version of this Article did not correctly credit and cite relevant previous work.

The fifth to seventh sentences of the fifth paragraph of the 'Three-dimensional imaging of the defects' section previously read: "In our case, BCDI is sensitive to defects such as voids and dislocations through its strain field sensitivity rather than the spatial resolution[46]. This is illustrated by the relationship between the continuum representation of the crystal, $\varphi(r)$, and the diffraction intensity, I(q) in the far field under a perfectly coherent illumination and in the kinematical scattering approximation given by $I(q) \approx \left|\mathcal{F}(\varphi(r)e^{iQ.u(r)}\right|^2$. Here, *r* and *q* are the real and reciprocal space coordinates respectively, $\mathcal{F}$ is the Fourier transform, Q is the measured Bragg peak, and *u*(*r*) is the vector displacement field that is a continuum description of how the atoms are displaced from their equilibrium positions[47]."

The correct version reads: "In our case, BCDI is sensitive to defects such as voids and dislocations through its strain field sensitivity rather than the spatial resolution[46]. This is demonstrated by the relationship $I(q) \approx \left|\mathcal{F}(\varphi(r)e^{iQ.u(r)}\right|^2$. whereby $I(q)$ is the intensity, $\varphi(r)$ is the mathematical description of the crystal as a continuum, $\mathcal{F}$ denotes the Fourier transformation operator, *Q* is the Bragg reflection that was measured, and *u*(*r*) is the displacement field[47]."

The final six sentences of the Results section previously read:

"Furthermore, underestimating the defect density prevents TEM from accurately determining the corresponding change in properties. For instance, Weiß et al. show a factor of 2 between measured and calculated change in hardness for neutron irradiated EUROFER97[71]. Meanwhile, Reza et al. report the same discrepancy between Transient Grating Spectroscopy (TGS)-measured and TEM-determined thermal diffusivity for self-ion irradiated tungsten[72]. It is important to note that when Reza et al. included small defects from molecular dynamics (MD) simulations, the combination of the TEM and MD data matches TGS measurements. This result confirms the theory that point defects play a significant role in the thermal diffusivity of a material and further reinforces the need to accurately characterize small defects in order to evaluate irradiation-induced changes in properties."

This has been replaced with:

""Hirst et al. opined that the underestimated defects density in TEM measurements comes with a corresponding mischaracterization of the materials properties[70]. This is demonstrated in a study by Weiß et al. who showed that the hardness values obtained from TEM data of neutron irradiated reduced activation ferritic/martensitic steel is significantly smaller than values from tensile testing. This clearly support the notion that underestimation of point defects from TEM analysis which goes into the dispersed barrier hardening model affects the calculated hardness value[71]. Hence, the difference in the magnitude of swelling between TEM and BCDI estimates is well justified. In a bid to accurately quantify nanoscale defects in irradiated materials, Meslin et al., used multiple characterization techniques which include TEM, Small Angle Neutron Scattering, Positron Annihilation Spectroscopy and Atom Probe Tomography which are sensitive to different types of nanoscale defects. The study clearly demonstrates the strength and complementarities of each technique[72]. This further support the need to develop multiple characterization techniques that can complements TEM for defects quantification and building predictive tools."

Consequently, Reference 72, which previously read "Reza, A., Yu, H., Mizohata, K. & Hofmann, F. Thermal diffusivity degradation and point defect density in self-ion implanted tungsten. *Acta Mater.* **193**, 270–279 (2020)", has been replaced by "Meslin, E. et al. Characterization of neutron-irradiated ferritic model alloys and a RPV steel from combined APT, SANS, TEM, and PAS analyses *J. Nucl. Mater.* **406**, 73–83 (2010)."

This has been corrected in both the PDF and HTML versions of the Article.

Published online: 29 June 2023