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Corrigendum

# Corrigendum to "The brittle-to-ductile transition in cold-rolled tungsten sheets: Contributions of grain and subgrain boundaries to the enhanced ductility after pre-deformation" [Nucl. Mater. Energy 25 (2020) 100769]

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The author kindly asks to excuse a typing error in Eq. (4) of the paper. The property chord length $\bar{\lambda}$ was raised to the wrong power. In the published version Eq. (4) is incorrectly given as

$$T_{\mathrm{BDT}}^{\mathrm{mn}} = T_3 - A_3 \bar{r}_{\mathrm{x|\lambda}}{}^{0.5} \bar{\lambda}^{-1} \qquad \text{(4 published)}$$

where $T_{\mathrm{BDT}}^{\mathrm{mn}}$ is the brittle-to-ductile-transition (BDT) temperature related to a crack system mn, whereby in a specific example n and m are replaced by a valid set of the directions L, T, or S. Furthermore, $T_3$ and $A_3$ are constants, $\bar{r}_{\mathrm{x|\lambda}}$ represents the aspect ratio defined by the mean boundary spacing perpendicular to the idealized crack plane in relation to $\bar{\lambda}$, which is the mean chord length, i.e. the boundary spacing along the crack front.

The correct equation must be written as

$$T_{\mathrm{BDT}}^{\mathrm{mn}} = T_3 - A_3 \bar{r}_{\mathrm{x|\lambda}}{}^{0.5} \bar{\lambda}^{-0.5} \qquad \text{(4corrected)}$$

with the same properties as above.

*We want to stress the fact that the results of this paper are not affected by this typing error since data analysis was conducted with the correct equation as the description of the X-axis in Fig. 10 demonstrates.*

For clarification, the route of deriving Eq. (4corrected) from Eq. (5) in the published manuscript is outlined briefly in the following. In Reiser et al. [1] the brittle-to-ductile transition temperature is given as

$$T_{\mathrm{BDT}} = T_0 - A d_\delta{}^{0.5} \mathrm{d}_\lambda{}^{-1} \qquad (5)$$

where $T_0$ and $A$ are constants. The variable $d_\delta$ reflects the mean free path for dislocation glide and $\mathrm{d}_\lambda$ is denoted as mean dislocation source spacing along the crack front. Replacing these functional elements of the discrete dislocation dynamics (DDD) simulations by Reiser et al. [1] with real microstructural properties leads to the formulation

$$T_{\mathrm{BDT}}^{\mathrm{mn}} = T_0 - A \bar{d}_{\mathrm{x}}{}^{0.5} \bar{\lambda}^{-1} \qquad \text{(A)}$$

where $\bar{d}_{\mathrm{x}}$ is the mean boundary spacing perpendicular to the idealized crack plane and $\bar{\lambda}$ is the chord length, i.e. the mean boundary spacing along the idealized crack front. Expressing $\bar{d}_{\mathrm{x}}$ utilizing $\bar{\lambda}$ is done by the formulation of the ratio in the manner

$$\bar{r}_{\mathrm{x|\lambda}} = \bar{d}_{\mathrm{x}} \bar{\lambda}^{-1} \qquad \text{(B)}$$

Inserting Eq. (B) in Eq. (A) leads to

$$T_{\mathrm{BDT}}^{\mathrm{mn}} = T_0 - A \left(\bar{r}_{\mathrm{x|\lambda}}{}^{0.5} \bar{\lambda}^{-0.5}\right) \bar{\lambda}^{-1} \qquad \text{(C)}$$

After shortening $\bar{\lambda}$ in the numerator and denominator of the above equation, finally, Eq. (4corrected) is obtained.

## Reference

[1] J. Reiser, A. Hartmaier, Elucidating the dual role of grain boundaries as dislocation sources and obstacles and its impact on toughness and brittle-to-ductile transition, Sci. Rep. 10 (2020) 2739, https://doi.org/10.1038/s41598-020-59405-5.

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