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Supplementary information

Hydrogen trapping and embrittlement in high-strength Al alloys

In the format provided by the authors and unedited

Supplementary Information

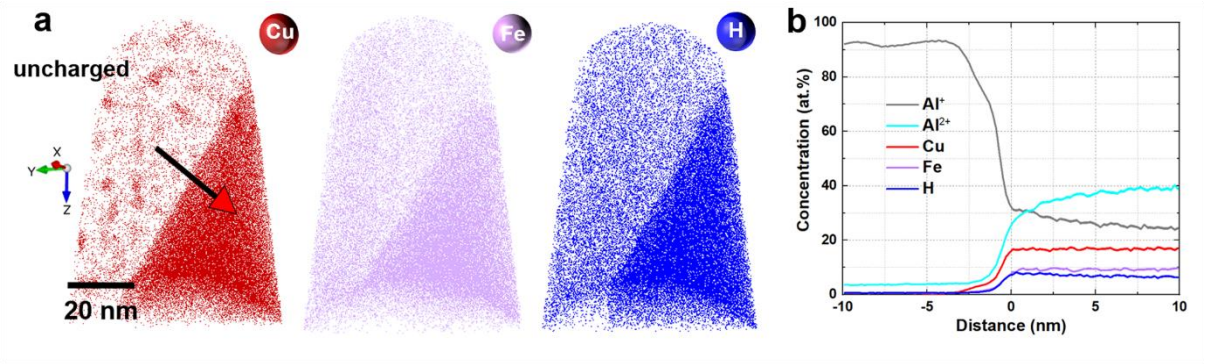

Fig. 1. APT analysis of a peak-aged Al sample containing Al_7Cu_2Fe intermetallic phase. (a) Atom maps of Cu, Fe, H are presented, with the intermetallic phase visualized by the Cu-Fe enriched region. (b) Composition profile across the intermetallic phase showing H concentration of 9 at.%.

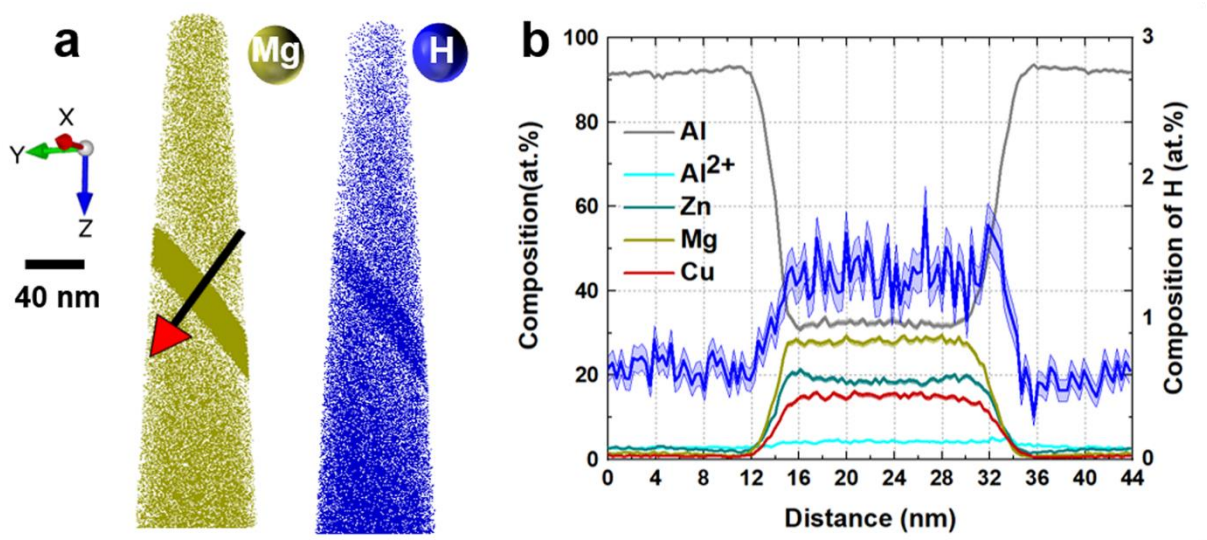

Fig. 2. APT analysis of a peak-aged Al sample containing T-phase. (a) Atom maps of Mg, and H are presented. (b) Composition profile across the T-phase showing H concentration of 1.5 at.%.

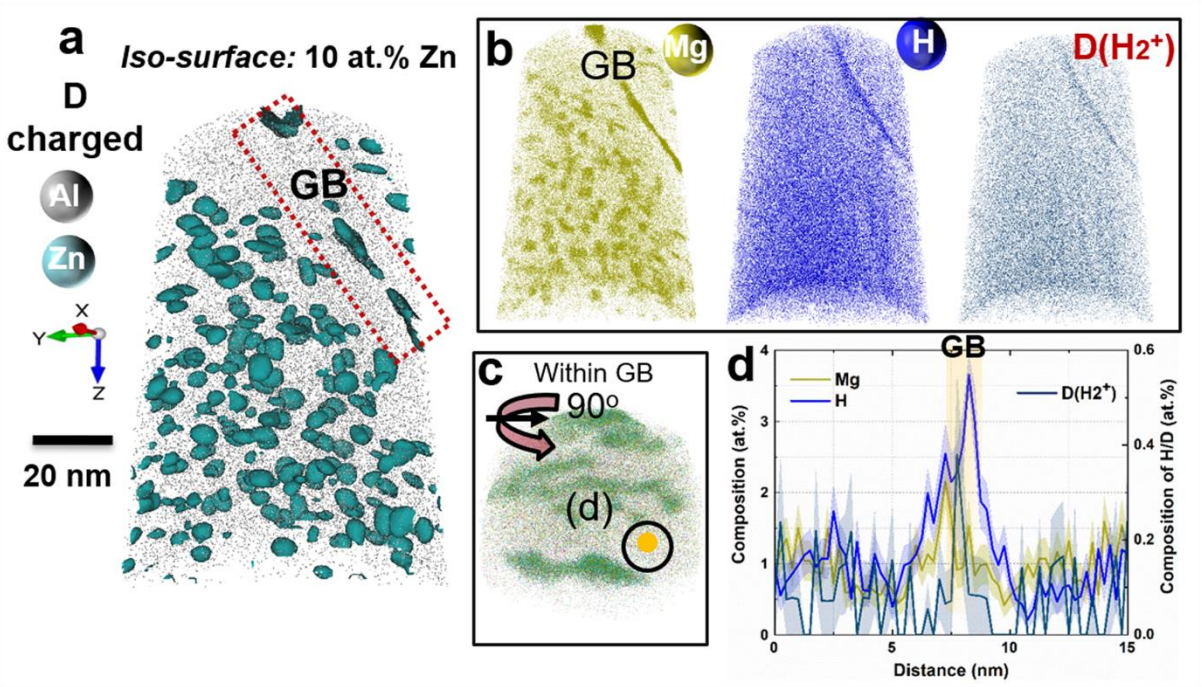

Fig. 3. APT analysis of a GB in the peak-aged Al-Zn-Mg-Cu sample subjected to D-charging (120 ^{o}C/24h). (a) A set of isosurfaces highlight the dispersion of fine Zn-rich precipitates in the matrix and of the larger ones at the GB. (b) Atom maps of Mg, H and D(H_2^+). (c) Solute distribution at the GB plane. (d) Representative solute composition profile across the GB in between of precipitates shown in the region highlighted by the circle.

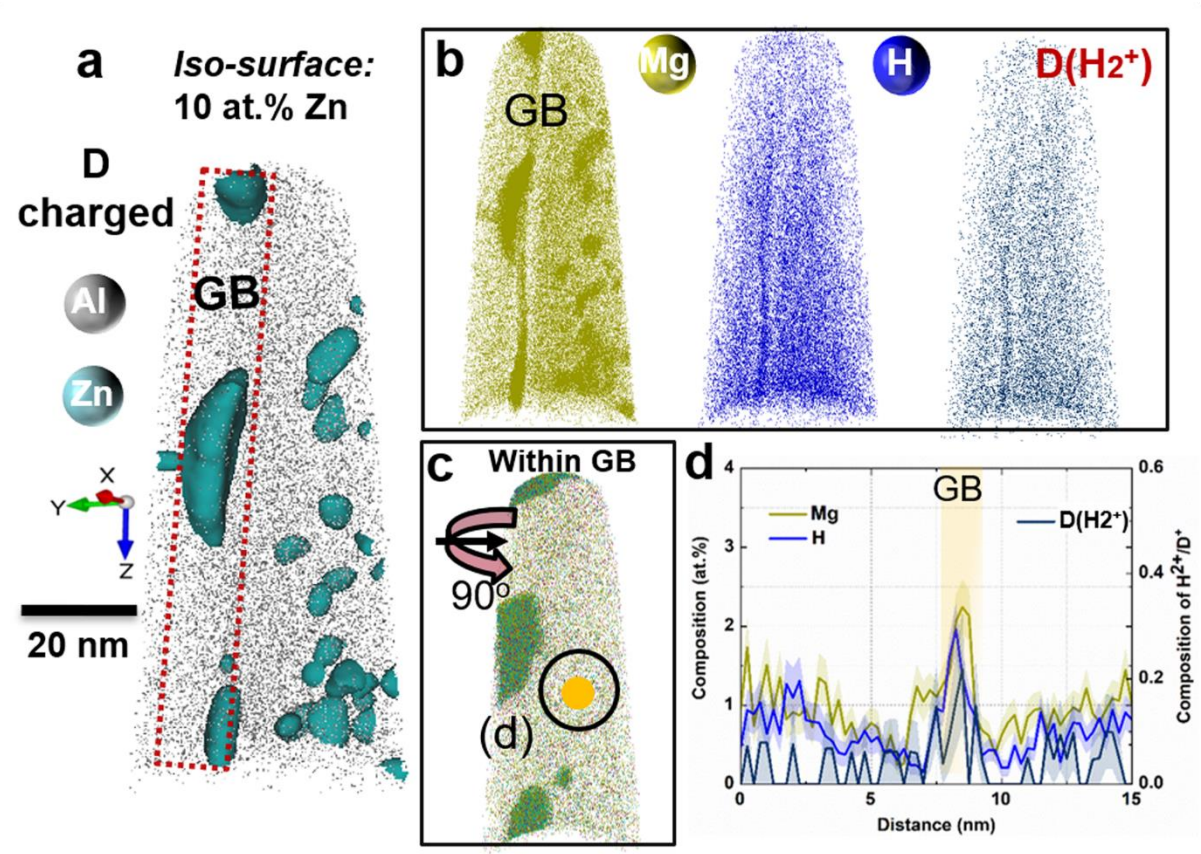

Fig. 4. APT analysis of a GB in the peak-aged Al-Zn-Mg-Cu sample subjected to D-charging (120 °C/24h). (a) A set of isosurfaces highlight the dispersion of fine Zn-rich precipitates in the matrix and of the larger ones at the GB. (b) Atom maps of Mg, H and D(H_2^+). (c) Solute distribution at the GB plane. (d) Representative solute composition profile across the GB in between of precipitates shown in the region highlighted by the circle.

Table 1

H and D composition within the second-phases and grain boundaries in the D-charged and uncharged states.

Interface	Condition	H (at.%)	**D (at.%)**	**C_H/C_D**
Zr-dispersoid	uncharged	8.50	0	0
	D-charged	9.50	**2.80**	**3.39**
S phase	uncharged	6.82	0.03	227
	D-charged	4.20	**0.12**	**35**
Grain boundary	uncharged	1.37	0.10	12
	D-charged	2.42	**0.31**	**7.81**