Variability in FeB Pair Association Rates in Silicon under Ultrasound Loading: Effects of Acoustic Wave Types

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Keywords: Ultrasound, Silicon, Iron-boron pair, Point defect, Acousto-defect interaction, Positron annihilation spectroscopy.

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Features of FeB Pair Association under Ultrasonic Loading

Experiment details. The section
Results of Acousto-induced Changes in Fe Ion Migration.

Positron Annihilation on FeB Complex: the Searching Estimations

Positron Trapping.
Elementally-Specific Annihilaton Radiation.

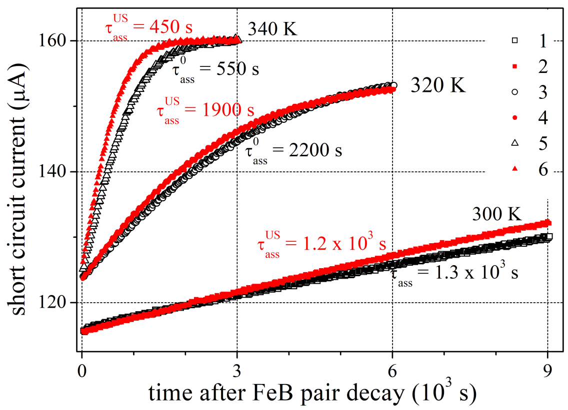

Fig. 1: Measured short circuit current plotted as a function of the time after FeB decay without USL (1, 3, 5, empty black marks) and under USL (2, 4, 6. filled red marks). T, K: 300 (1, 2), 320 (3, 4), 340 (5, 6). The values of τ^0_{ass} and $\tau^{\mathrm{US}}_{\mathrm{ass}}$ obtained by the methodology described in [36, 37] are shown also.

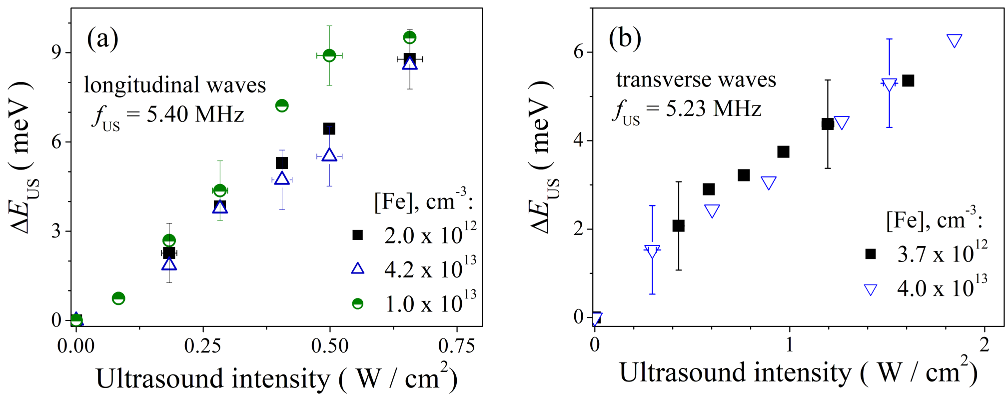

Fig. 2: Dependencies of AI change in migration energy on US intensity for samples with different iron concentrations. f_{US}, MHz: 5.40 (a), 5.23 (b). AW type: longitudinal (a), transverse (b). $T = 340$ K.

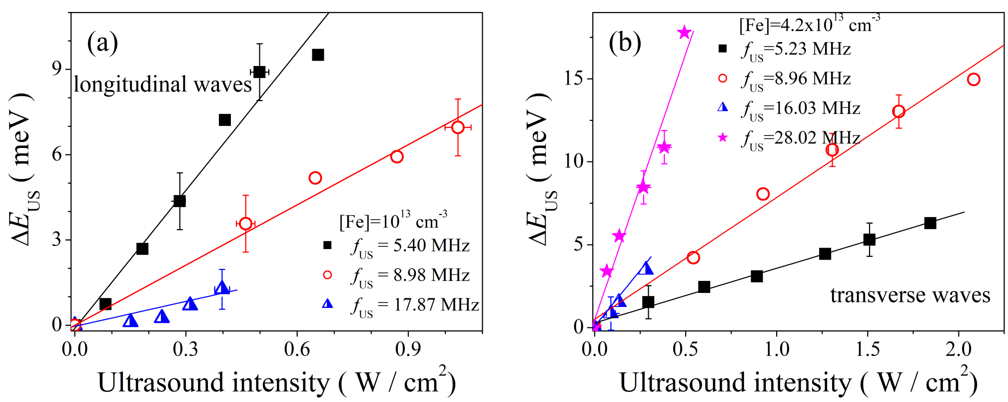

Fig. 3: Dependencies of AI change in migration energy on US intensity for various frequencies. [Fe], 10^{13} cm^{-3}: 1.0 (a), 4.2 (b). AW type: longitudinal (a), transverse (b). $T = 340$ K. The marks are experimental results, the lines are the linear fitted curves.

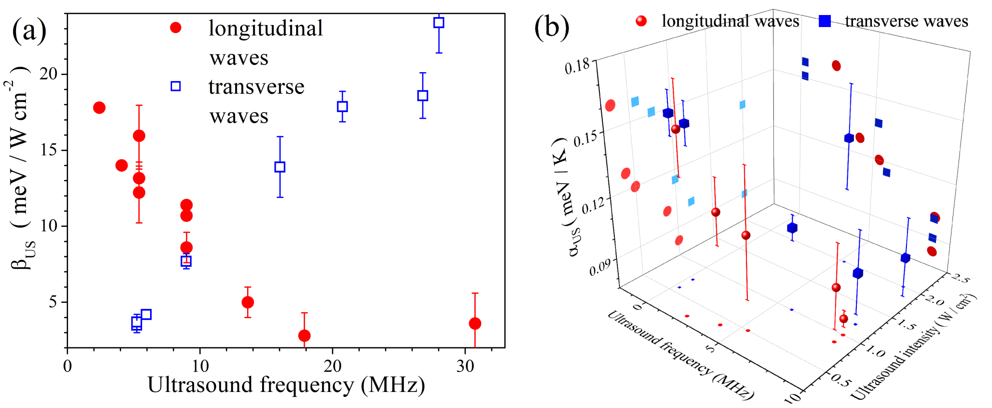

Fig. 4: Dependencies of intensity coefficient (a) and temperature coefficient (b) of AI changes on US frequency and intensity. β_{US} values were obtained at $T = 340$ K. AW type: longitudinal (red circles), transverse (blue squares).

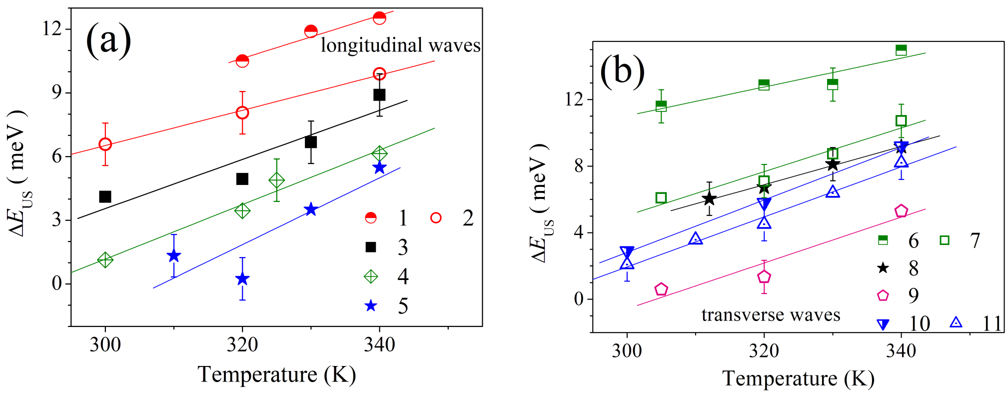

Fig. 5: Temperature dependencies of ΔE_{US}. AW type: longitudinal (a), transverse (b). f_{US}, MHz: 8.98 (1, 2), 5.04 (3), 4.09 (4), 2.39 (5), 8.96 (6, 7), 5.94 (8), 5.23 (9), 0.31 (10, 11). W_{US}, W/cm^2: 1.0 (1, 8), 0.87 (2), 0.1 (3), 0.4 (4), 0.3 (5), 2.0 (6, 9), 1.2 (7), 0.76 (10), 0.58 (11). The marks are the experimental results, the lines are the linear fitted curves.

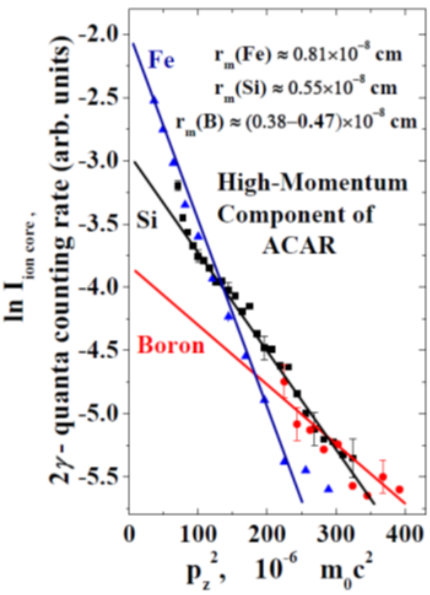

Fig. 6: The high-momentum component of the elementally-specific ACAR spectra obtained by the spectrometer of high geometrical angular resolution $\Delta \approx 0.48\times10^{-3}\, m_0\, c\, (m_0$ and c are the electron mass and the light velocity, respectively). The measurements were performed at room temperature and their results are given for boron (dots), silicon (squares), and iron (triangles). The electron-positron ionic radus r_m were restored (see [7, 8, 9] for more detail). The lines are the results of fitting, the slopes of the linear functions are obtained with the accuracy which is characterized by the standard deviation / the Pearson's coefficient, respectively: 0.042/0.998 (Fe), 0.114/0.956 (B) and 0.101/0.99 (Si).

Conclusion

Acknowledgments

N. A. is thankful to DAAD for partial support of this work. O. O. is thankful to NRFU (Pr. No. 2023.03/0252) for partial financial support of this work.

References

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$$c^2 = a^2 + b^2. \tag{1}$$

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