MOBSI1: TCS Si- alloys Mobility Database

Database name:	TCS Si- alloys Mobility Database	*Database acronym:*	MOBSI
Database owner:	Thermo-Calc Software AB	*Database version:*	1.0

MOBSI1 is a kinetic database developed for calculating self and impurity diffusivities in both solid and liquid Si. Coupled together with TCSI, a thermodynamic database from Thermo-Calc, diffusion phenomena can be simulated by using the add-on Diffusion Module (DICTRA) and/or Precipitation Module (TC-PRISMA) for the production of solar grade cell Si.

Included Elements (28)

Ag	Al	As	Au	B	Bi	C	Co	Cr	Cu	Fe	Ga	Ge	In
Li	Mn	N	Ni	O	P	S	Sb	Si	Sn	Te	Ti	V	Zn

Included Phases

Diamond_A4 Liquid

Please note that apart from the above phases for which diffusion data are included in the database, other phases may also be included in a simulation. However, these phases will be treated as so-called diffusion “NONE”, i.e. there will be no diffusion considered in such phases. Phases which are not listed above will automatically be entered as diffusion “NONE” in the DICTRA module in Thermo-Calc, provided a thermodynamic description for such phases has been retrieved prior to reading data from the mobility database.

Assessed Systems

All data are critically assessed except for that of some elements in liquid Si. For unassessed data, empirical rules have been used for estimation.

Data for all elements in solid silicon have been either assessed based on experimental data or accepted from available assessment work via critical evaluations. Data for all elements except Cr in liquid silicon have also been provided. Due to the difficulty in measuring diffusivity in melt, most of mobility data in liquid silicon were estimated by using empirical rules, which were found reliable for practical applications.

References

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2. Pichler, P. (2004). Intrinsic Point Defects. In Intrinsic Point Defects, Impurities, and Their Diffusion in Silicon (pp. 77–227). Vienna: Springer Vienna. http://doi.org/10.1007/978-3-7091-0597-9
3. Sadoh, T., and Nakashima, H. (1991). Diffusion of vanadium in silicon. Applied Physics Letters, 58(15), 1653. http://doi.org/10.1063/1.105154
4. Tang, K., Øvrelid, E. J., Tranell, G., & Tangstad, M. (2010). Critical assessment of the impurity diffusivities in
5. Zhang, L., private communication, 2014.

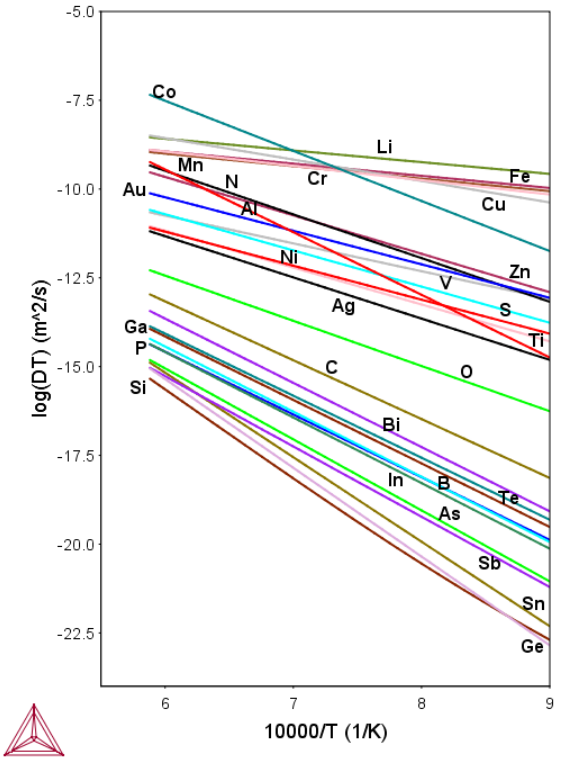

Figure 1. Calculated self and impurity diffusivity in solid silicon by using MOBSI1.

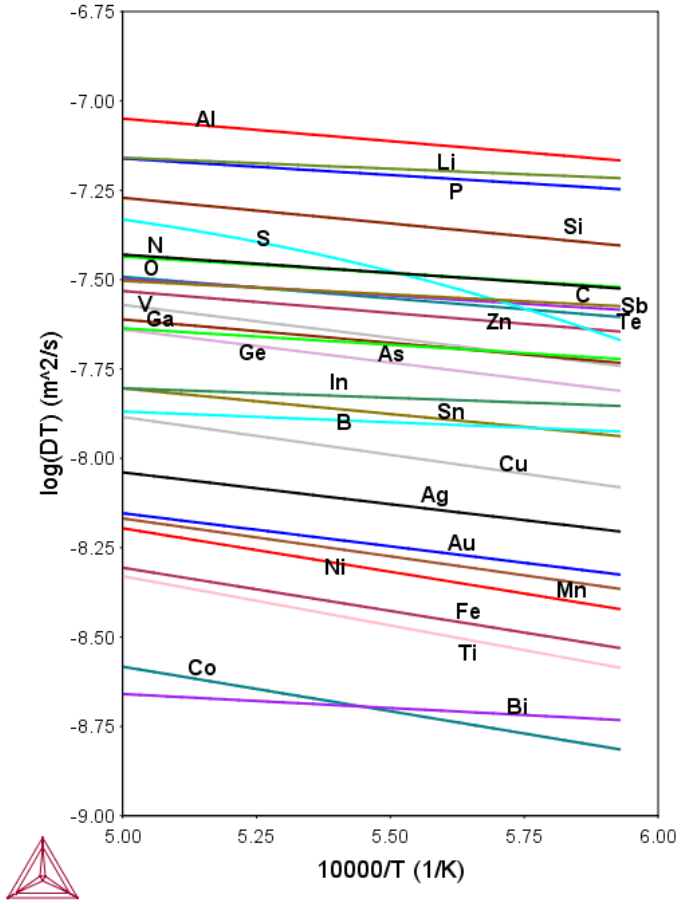

Figure 2. Calculated self and impurity diffusivity in liquid silicon by using MOBSI1.