MOBSI1 - TCS Silicon Alloy Mobility 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 DICTRA or TC-PRISMA for the production of solar grade cell Si.

The database contains 28 elements: 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. 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

1. T. Sadoh and H. Nakashima, Appl. Phys. Lett. 58, 1653(1991).
2. P. Pichler, Intrinisic Point Defects, Impurities, and Their Diffusion in Silicon, Springer-Verlag Wien GmbH, 2004.
3. K. Tang et al., JOM, 61, 49-55 (2009).
4. S.L. Cui et al., JMM 48 (2) B 227-240 (2012).
5. W. Chen et al., Philosophical Magazine, 94(14)1552-1577(2014).
6. L. Zhang, private communication, 2014.

Thermo-Calc Software AB
Norra Stationsgatan 93
SE-113 64 Stockholm
SWEDEN

info@thermocalc.com
Phone: +46 8 545 959 30
Fax: +46 8 673 37 18
www.thermocalc.com

Org.No: 556540-6138
VAT No: SE556540613801

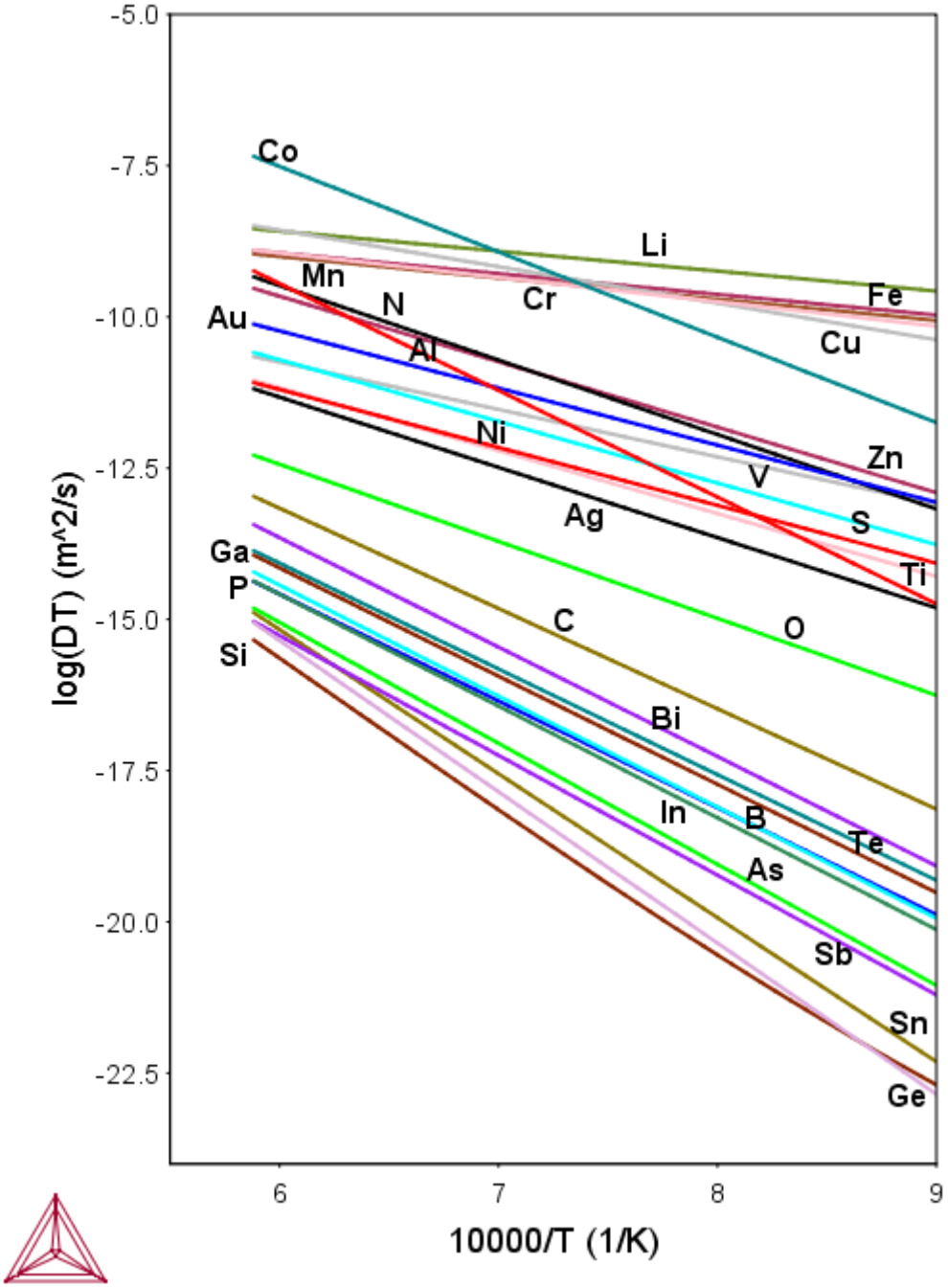

Figure 1. Calculated self and impurity diffusivity in solid silicon by using MOBSI1.

Thermo-Calc Software AB
Norra Stationsgatan 93
SE-113 64 Stockholm
SWEDEN

info@thermocalc.com
Phone: +46 8 545 959 30
Fax: +46 8 673 37 18
www.thermocalc.com

Org.No: 556540-6138
VAT No: SE556540613801

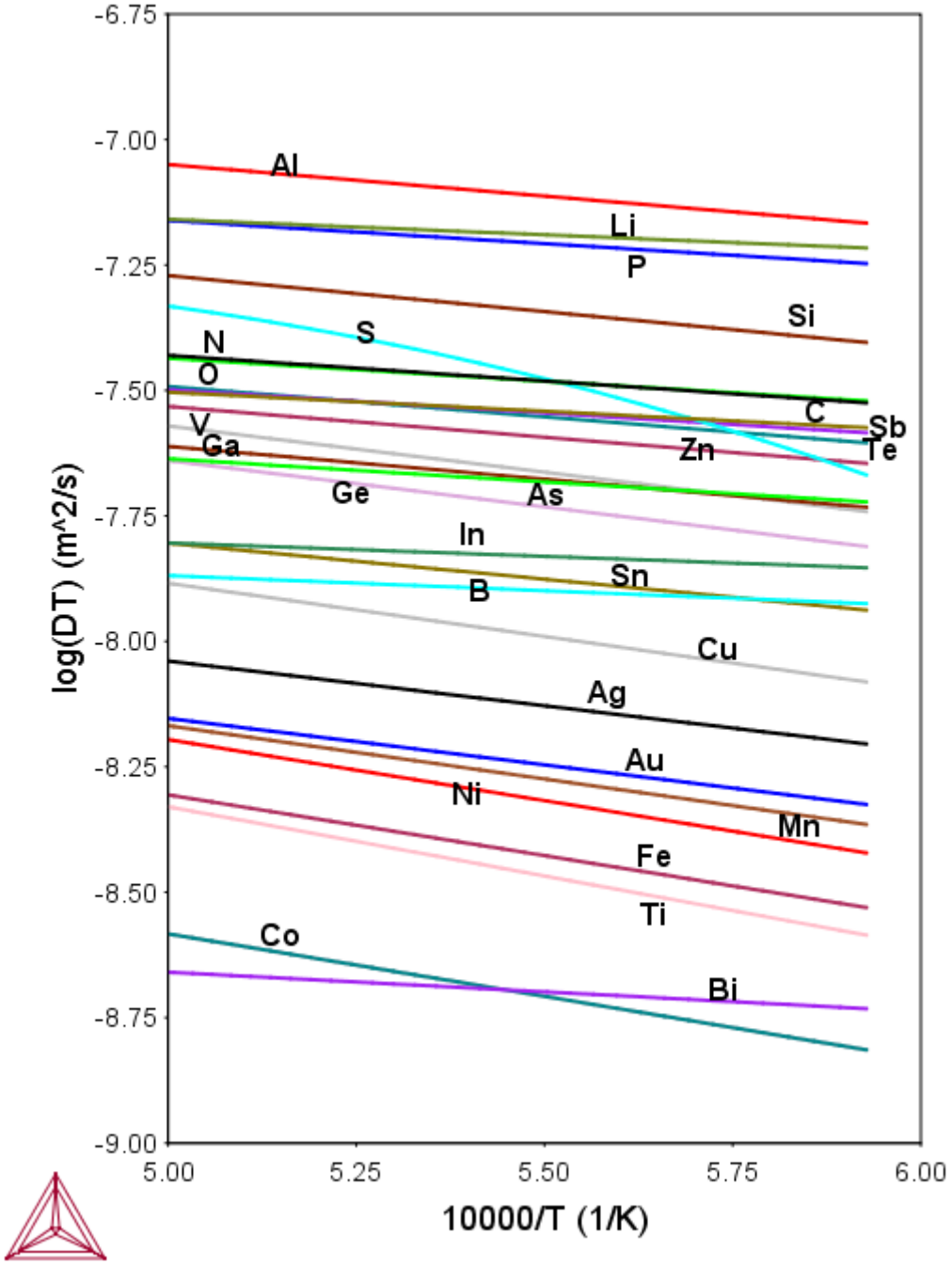

Figure 2. Calculated self and impurity diffusivity in liquid silicon by using MOBSI1.