Self-Diffusion and some Related Quantities in Si

D_0 and Activation Energy E_{SD} for Self-Diffusion and for Various Impurities Including Intrinsic Point Defects in Si (fitted to $D = D^0 \exp(-E_{SD}/k_B T)$)

Illustration

The following table, which does not even come close to contain all relevant data, nicely illustrates how difficult it is to obtain reliable data for the point defect parameters. The situation has not yet (**1999**) changed, the values for formation and migration energies reported in the literature still vary from year to year.

Diffusing Element	Measured Quantity (Type of Diffusion Mechanism)	D_o [10^{-14} m² s⁻¹]	E_{SD} [eV]	Reference
Si	D^{Tracer}	1800	4.77	Peart, 1966
		1200	4.72	Ghostagore, 1966
		9000	5.13	Fairfield und Masters, 1967
		1460	5.02	Mayer et al., 1977
		8	4.1	Hirvonen und Antilla, 1974
		154	4.65	Kalinowski und Seguin, 1980
		20	4.4	Demond et al.; 1983
Si	$D_I C_I^{eq}$	914	4.84	Stolwijk et al.; 1984
		320	4.80	Stolwijk et al.; 1988
		2000	4.94	Hauber et al., 1989
		1400	5.01	Mantovani et al., 1986
Si	$D_V C_V^{eq}$	0.57	4.03	Tan und Gösele, 1985
		10^{-5}	0.4	Tan und Gösele, 1985
I	D_I	$3.75 \cdot 10^{-9}$	0.13	Bronner und Plummer, 1985
		$8.6 \cdot 10^{-5}$	4.0	Taniguchi et al.; 1983
		$2{,}42 \cdot 10^{-5}$	0,937	Falster et al.98
V	D_V	0.1	2.0	Tan und Gösele, 1985
		$1{,}3 \cdot 10^{-7}$	0,457	Falster et al.98
Ge	D^S	2500	4.97	Hettich et al.; 1979
Sn	D^S	32	4.25	Teh et al., 1968
C_S	D^S	1.9	3.1	Newman and Wakefield, 1961

C$_i$	*D$_i$*	4.4	0.88	Tipping and Newman, 1987
O	*D$_i$*	0.07	2.44	Mikkelsen, 1986