Monosilane (SiH_4)

1. Recommended electron collision cross sections

Source:

(1) Elastic momentum transfer cross section

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
.01000	66.02120	1.50000	15.60000
.01500	51.36570	2.00000	20.79990
.02000	42.98610	3.00000	24.56000
.03000	33.45460	4.00000	23.44300
.04000	27.91240	6.00000	20.14630
.06000	19.46930	8.00000	18.15680
.08000	13.16240	10.00000	16.64000
.10000	9.04000	15.00000	13.68000
.15000	3.96000	20.00000	12.08000
.20000	2.12000	30.00000	9.84000
.30000	1.32000	40.00000	8.56610
.40000	1.45540	60.00000	6.96760
.60000	2.46430	80.00000	5.95080
.80000	4.72370	100.00000	5.28000
1.00000	8.40000		

(2) Vibrational excitation cross section (qv24) Threshold = 0.113 eV

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
.11300	0	1.80000	11.00000
.11800	.10000	2.00000	12.00000
.12000	.70000	2.30000	11.00000
.12500	2.00000	2.70000	9.20000
.13000	2.80000	3.00000	8.00000
.14000	3.30000	3.50000	6.00000
.15000	3.60000	4.00000	4.50000
.17000	3.90000	5.00000	2.60000
.20000	4.00000	6.00000	1.70000
.24000	3.85000	7.20000	1.23000
.30000	3.60000	9.00000	.96000
.40000	3.30000	11.00000	.78000
.50000	3.00000	14.00000	.60000
.60000	3.00000	18.00000	.43800
.70000	3.10000	24.00000	.30000
.80000	3.40000	32.00000	.19000
1.00000	4.30000	46.00000	.10000
1.20000	5.80000	50.00000	.00000
1.50000	8.40000	100.00000	.00000

(3) Vibrational excitation cross section (qv13) Threshold = 0.271 eV

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
.27100	.00100	.27500	.10000

.27700	.40000	2.00000	4.00000
.28000	1.20000	2.20000	5.00000
.28700	1.50000	2.50000	5.40000
.30000	1.82000	2.80000	5.00000
.32000	2.14000	3.00000	4.70000
.35000	2.40000	3.50000	3.20000
.37100	2.50000	4.00000	2.40000
.40000	2.50000	5.00000	1.55000
.45000	2.30000	6.20000	1.00000
.50000	1.80000	7.00000	.73000
.60000	1.00000	8.20000	.50000
.70000	.84000	10.00000	.32700
.80000	.80000	12.00000	.22000
1.00000	.80000	14.00000	.15200
1.20000	.84000	16.50000	.10000
1.40000	.92000	20.00000	.00000
1.60000	1.30000	100.00000	.00000
1.80000	2.50000		

(4) Electron attachment cross section (qa×1000**)** Threshold = 7.05 eV

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
7.05000	.00000	8.60000	14.85000
7.10000	.56250	8.70000	14.40000
7.20000	1.95000	8.80000	12.93750
7.30000	3.18750	8.90000	11.25000
7.50000	5.25000	9.00000	9.48750
7.70000	7.50000	9.20000	6.93750
7.80000	8.25000	9.30000	5.32500
7.90000	9.63750	9.40000	3.60000
8.00000	10.65000	9.60000	2.25000
8.20000	12.93750	9.90000	.89250
8.30000	14.10000	10.00000	.46880
8.40000	14.85000	10.20000	.00000
8.50000	15.00000	100.00000	.00000

(5) Neutral dissociation cross section (qv13) Threshold = 8.40 eV

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
8.40000	.00100	14.00000	5.57000
8.50000	.50000	16.00000	5.80000
8.60000	1.10000	18.00000	5.94000
8.70000	1.46000	20.00000	6.07000
8.80000	1.71000	25.00000	6.27000
9.00000	2.20000	30.00000	6.45000
9.20000	2.58000	35.00000	6.63000
9.40000	2.90000	40.00000	6.78000
9.60000	3.20000	45.00000	6.93000
9.80000	3.48000	50.00000	7.03000
10.00000	3.72000	60.00000	7.23000
10.60000	4.30000	70.00000	6.50000
11.00000	4.56000	80.00000	5.78000
12.00000	5.06000	90.00000	5.13000

100.00000	4.57000

(6) Total ionization cross section (qi) Threshold = 11.60 eV

Energy(eV)	Cross section(Å^2)	Energy(eV)	Cross section(Å^2)
11.60000	.00100	30.00000	4.50000
12.00000	.10000	35.00000	4.85000
12.50000	.29000	40.00000	5.08000
13.00000	.47100	45.00000	5.25000
14.00000	.91000	50.00000	5.36000
15.00000	1.37000	60.00000	5.41000
16.60000	2.00000	68.60000	5.45000
18.30000	2.50000	80.00000	5.41000
20.00000	2.92000	100.00000	5.30000
25.00000	3.70000		

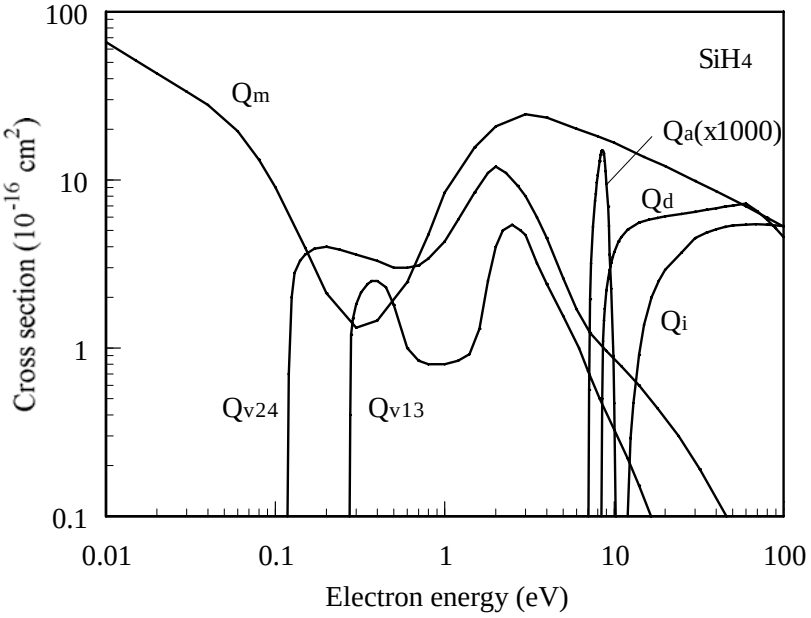


Fig. 1. Recommended electron collision cross sections for SiH_4.

2. Related electron swarm data

(1) Electron drift velocity, W, in pure SiH_4

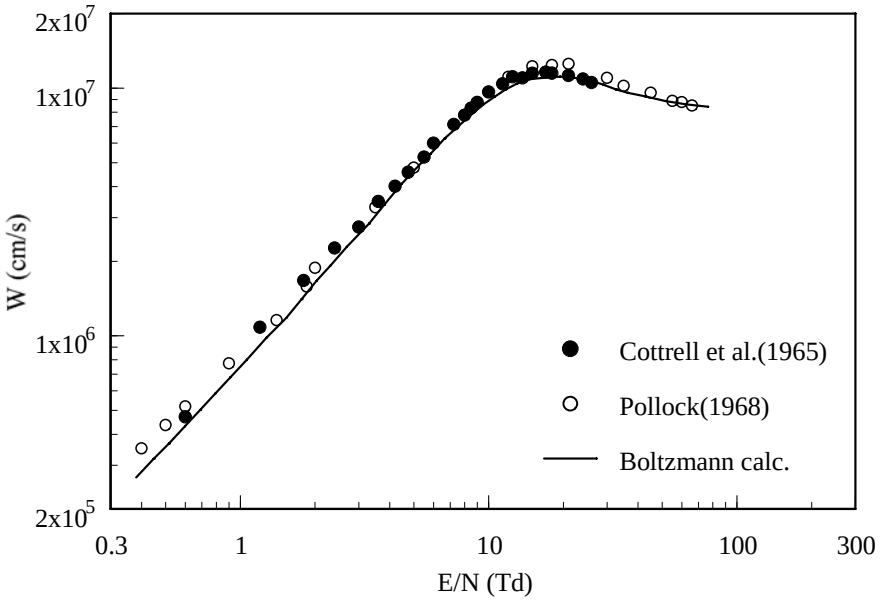


Fig. 2. Electron drift velocity in pure SiH_4.

(2) Electron characteristic energy in pure SiH_4.

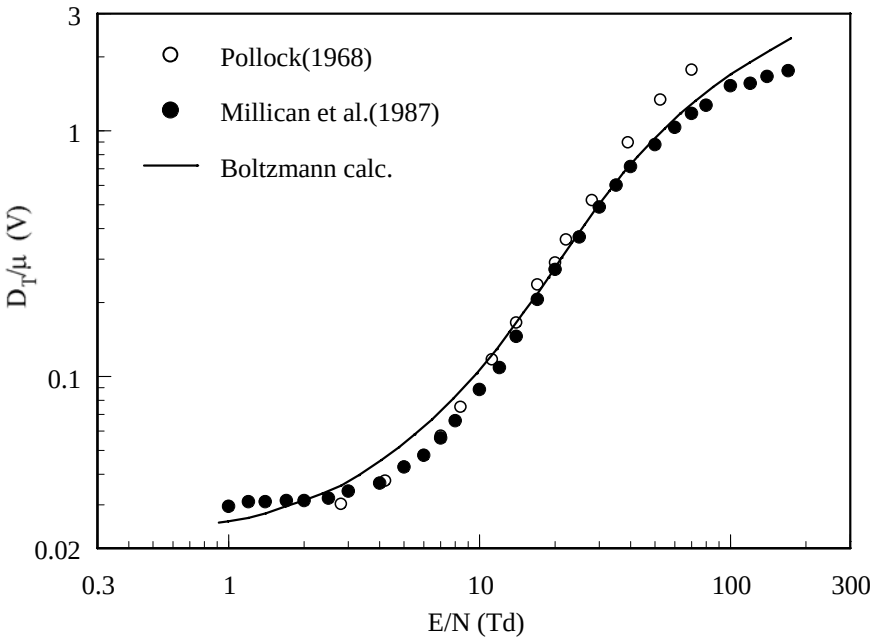


Fig. 3. Electron characteristic energy, D_T/μ , in pure SiH_4

(3) Ionization coefficient in pure SiH_4

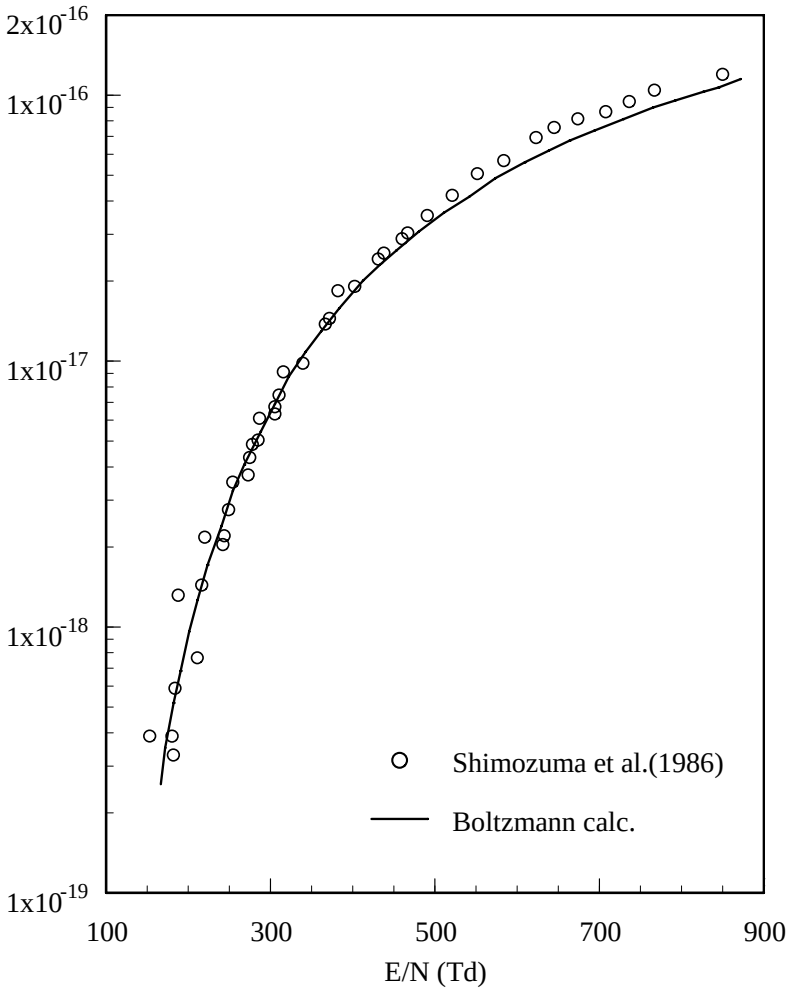


Fig. 4. Ionization coefficient in pure SiH_4.

(4) Electron attachment coefficient in pure SiH_4

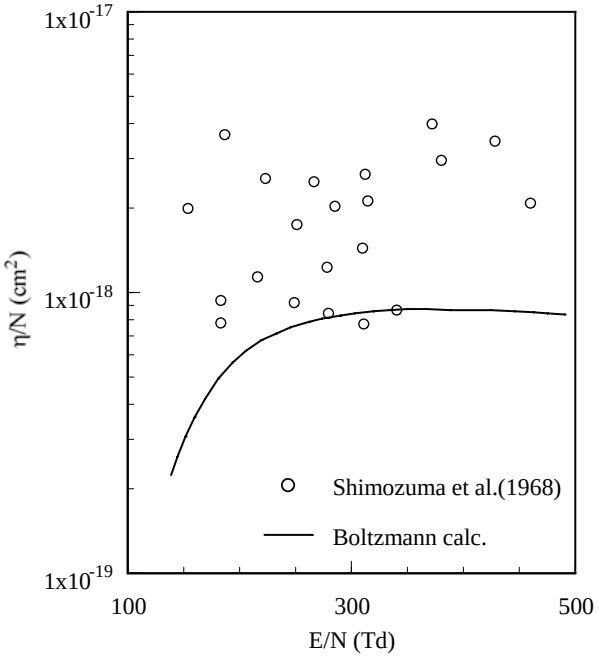
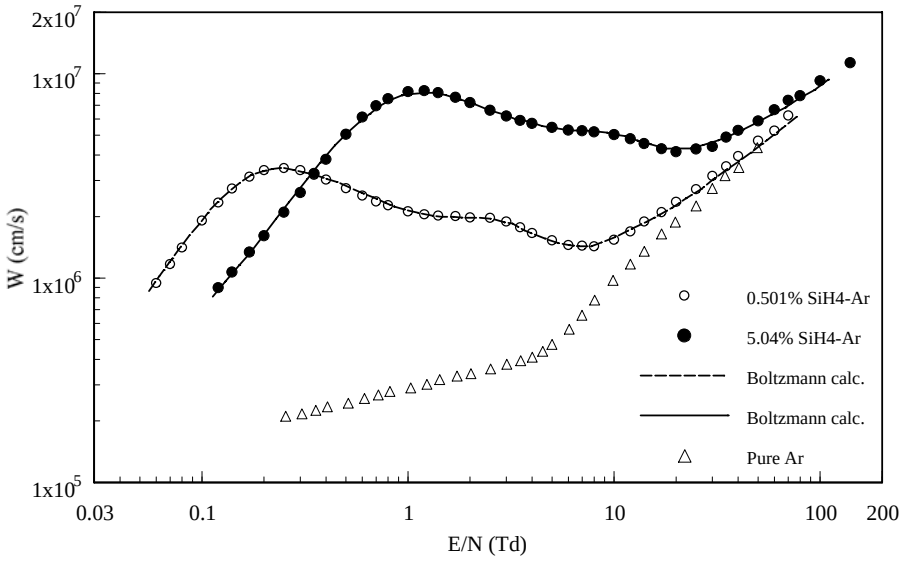
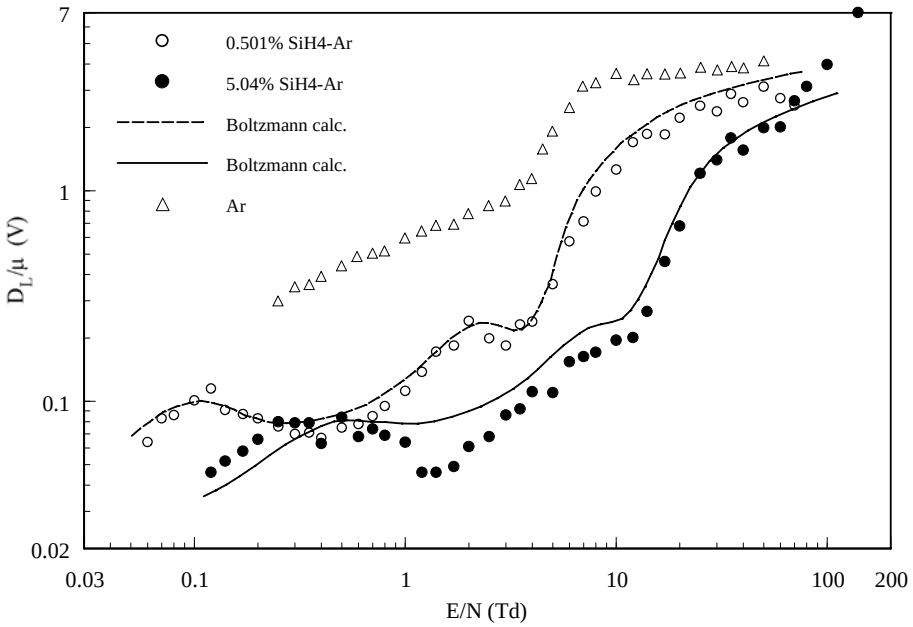


Fig. 5. Attachment coefficient in pure SiH_4.

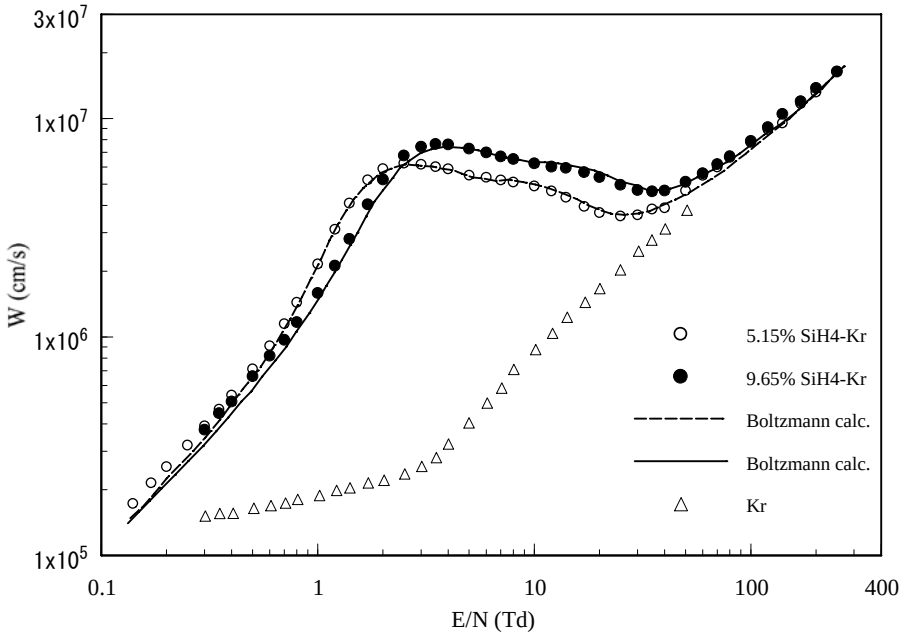
(5) Electron drift velocity in SiH_4-Ar mixtures



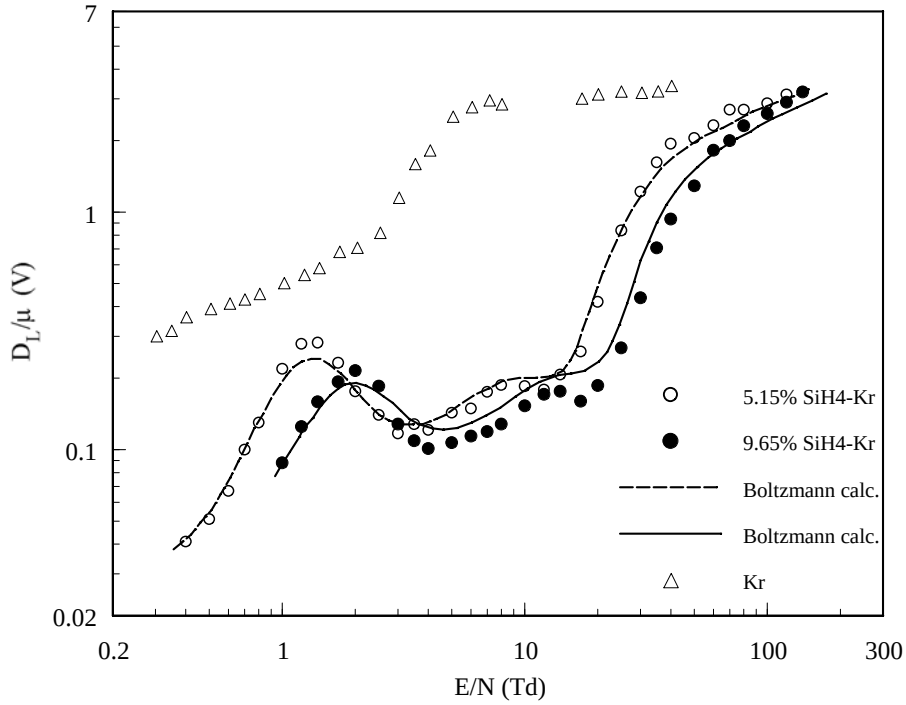
(6) D_L/μ in SiH_4-Ar mixtures



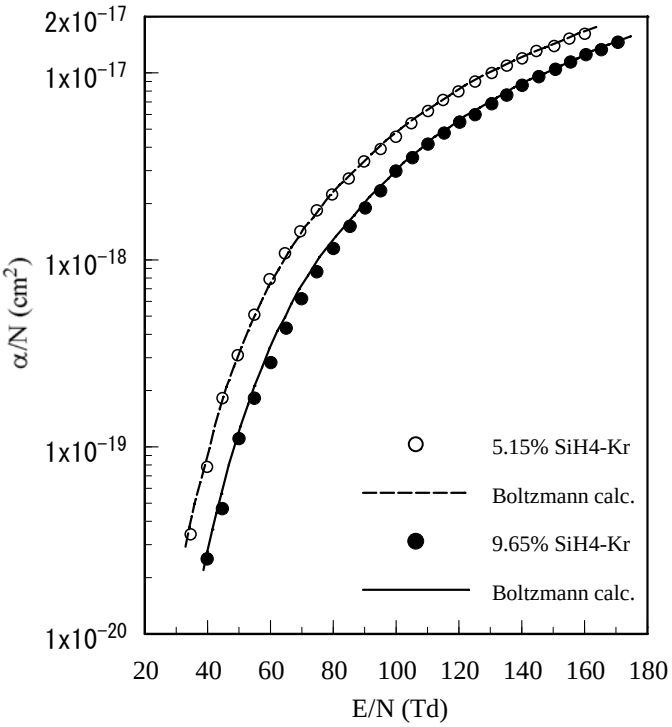
(7) Electron drift velocity in SiH_4-Kr mixtures



(8) D_L/μ in SiH_4-Kr mixtures



(9) Townsend ionization coefficient in SiH_4-Kr mixtures



(10) Electron attachment coefficient in SiH_4-Kr mixtures