

Table S1 Degrees of ionization at temperatures of 2000-8000 K using $1\text{E}^{21}\text{ m}^{-3}$ as electron number density, $k = 1.3806504\text{E}^{-23}\text{ JK}^{-1}$, $h = 6.62606896\text{E}^{-34}\text{ Js}$ and the first IP (eV) given in the table. The coefficients for the partition function are from Galan et al. (1968) and are valid until 7000 K

1 st IP		Plasma temperature												
	eV	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
As	9.79	0.000	0.000	0.000	0.000	0.000	0.002	0.031	0.282	1.780	8.069	25.393	52.466	75.569
Al	5.99	0.000	0.000	0.001	0.041	0.597	4.689	21.200	52.262	78.089	90.706	95.885	98.032	98.981
Au	9.23	0.000	0.000	0.000	0.000	0.000	0.003	0.040	0.321	1.850	7.907	24.324	50.733	74.415
B	8.30	0.000	0.000	0.000	0.000	0.001	0.012	0.123	0.812	3.855	13.439	33.310	58.066	77.275
Ba	5.21	0.000	0.004	0.318	6.417	40.278	79.705	94.072	98.012	99.214	99.643	99.820	99.901	99.942
Be	9.32	0.000	0.000	0.000	0.000	0.000	0.010	0.134	1.083	5.941	21.806	49.894	74.970	88.668
Bi	7.29	0.000	0.000	0.000	0.001	0.020	0.259	1.980	9.962	31.741	61.466	82.355	92.329	96.556
Br	11.81	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.040	0.262	1.325	5.278	16.328
C	11.26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.048	0.286	1.318	4.851	14.209
Ca	6.11	0.000	0.000	0.009	0.313	4.565	28.683	68.913	89.948	96.611	98.694	99.426	99.718	99.848
Cd	8.99	0.000	0.000	0.000	0.000	0.001	0.025	0.293	2.211	11.129	34.989	65.443	85.018	93.718
Cl	12.97	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.035	0.204	0.950	3.606
Co	7.88	0.000	0.000	0.000	0.000	0.013	0.191	1.686	9.453	32.182	63.237	83.907	93.191	96.965
Cr	6.77	0.000	0.000	0.000	0.014	0.266	2.642	14.994	45.254	75.170	90.151	95.958	98.191	99.113
Cs	3.89	0.003	0.423	10.097	54.302	87.504	96.508	98.790	99.488	99.745	99.856	99.910	99.939	99.956
Cu	7.73	0.000	0.000	0.000	0.001	0.017	0.265	2.371	13.194	41.681	72.926	89.500	95.908	98.289
F	17.42	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006
Fe	7.90	0.000	0.000	0.000	0.001	0.021	0.325	2.809	14.788	43.701	73.445	89.170	95.494	97.975
Ga	6.00	0.000	0.000	0.001	0.047	0.674	5.210	22.936	54.556	79.503	91.352	96.180	98.182	99.071
Ge	7.90	0.000	0.000	0.000	0.000	0.008	0.123	1.078	6.153	22.797	51.570	76.359	89.531	95.316
He	24.59	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hf	6.83	0.000	0.000	0.000	0.014	0.306	3.355	19.834	55.724	83.233	94.144	97.804	99.089	99.584
Hg	10.44	0.000	0.000	0.000	0.000	0.000	0.001	0.010	0.107	0.762	3.928	14.744	37.807	64.758
I	10.45	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.071	0.512	2.712	10.683	29.850	56.491
In	5.79	0.000	0.000	0.004	0.129	1.617	10.821	37.884	69.831	87.665	94.875	97.692	98.864	99.394

K	4.34	0.000	0.053	1.971	21.645	66.749	90.461	97.056	98.917	99.532	99.769	99.873	99.923	99.950
Kr	14.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016	0.110	0.573	2.414
La	5.58	0.000	0.001	0.054	1.391	14.143	52.926	84.038	94.933	98.190	99.259	99.658	99.826	99.904
Li	5.39	0.000	0.002	0.139	3.329	28.153	72.555	92.496	97.767	99.216	99.680	99.852	99.924	99.957
Mg	7.65	0.000	0.000	0.000	0.002	0.057	0.783	6.176	27.342	61.783	84.760	94.130	97.565	98.889
Mn	7.43	0.000	0.000	0.039	1.043	11.237	46.731	80.410	93.487	97.573	98.956	99.489	99.722	99.835
Mo	7.09	0.000	0.000	0.000	0.005	0.121	1.408	9.454	35.007	68.097	87.331	94.983	97.856	98.998
N	14.53	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.021	0.114	0.502
Na	5.14	0.000	0.001	0.092	1.950	16.911	55.824	84.641	94.880	98.083	99.181	99.607	99.792	99.881
Nb	5.53	0.000	0.000	0.031	0.850	9.571	43.238	78.928	93.303	97.672	99.077	99.587	99.795	99.889
Ne	21.56	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ni	7.64	0.000	0.000	0.000	0.000	0.009	0.136	1.177	6.691	24.591	54.377	78.542	90.705	95.859
O	13.62	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.020	0.099	0.404
Os	8.44	0.000	0.000	0.000	0.000	0.003	0.048	0.477	3.090	13.471	37.471	65.669	84.014	92.745
P	10.49	0.000	0.000	0.000	0.000	0.000	0.001	0.009	0.093	0.658	3.366	12.627	33.101	59.089
Pb	7.42	0.000	0.000	0.000	0.002	0.053	0.583	3.866	16.353	42.393	69.526	85.889	93.518	96.887
Pd	8.34	0.000	0.000	0.000	0.000	0.013	0.195	1.685	9.230	31.068	61.541	82.713	92.597	96.711
Pt	8.96	0.000	0.000	0.000	0.000	0.000	0.006	0.078	0.619	3.440	13.653	36.475	63.929	82.699
Ra	5.28	0.000	0.000	0.027	0.623	6.478	31.549	68.211	88.496	95.771	98.284	99.228	99.620	99.799
Rb	4.18	0.001	0.114	3.652	32.185	76.238	93.452	97.920	99.202	99.639	99.814	99.894	99.933	99.955
Re	7.83	0.000	0.000	0.000	0.001	0.018	0.259	2.139	11.130	34.973	64.958	84.341	93.186	96.890
Rh	7.46	0.000	0.000	0.000	0.001	0.030	0.384	2.931	14.147	40.666	69.807	86.866	94.311	97.390
Rn	10.75	0.000	0.000	0.000	0.000	0.000	0.001	0.010	0.111	0.834	4.483	17.119	42.903	70.066
Ru	7.36	0.000	0.000	0.000	0.000	0.000	0.005	0.029	0.127	0.436	1.232	2.966	6.221	11.526
S	10.36	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.016	0.100	0.478	1.810	5.606	14.256
Sb	8.61	0.000	0.000	0.000	0.000	0.001	0.022	0.254	1.857	9.195	29.639	58.995	80.778	91.548
Sc	6.56	0.000	0.000	0.000	0.000	0.000	0.001	0.012	0.118	0.790	3.834	13.659	34.319	59.869
Se	9.75	0.000	0.000	0.000	0.000	0.000	0.001	0.014	0.127	0.798	3.738	13.168	33.318	58.907
Si	8.15	0.000	0.000	0.000	0.000	0.004	0.066	0.620	3.810	15.725	41.099	68.495	85.392	93.297
Sr	5.69	0.000	0.000	0.043	1.231	13.568	52.968	84.427	95.120	98.257	99.281	99.665	99.828	99.905
Ta	7.55	0.000	0.000	0.000	0.002	0.051	0.683	5.260	23.566	56.380	81.348	92.538	96.850	98.554

Tc	7.28	0.000	0.000	0.000	0.003	0.065	0.782	5.543	23.406	54.860	79.706	91.514	96.296	98.257
Te	9.01	0.000	0.000	0.000	0.000	0.000	0.008	0.100	0.764	4.114	15.684	39.827	66.768	84.265
Ti	6.83	0.000	0.000	0.001	0.030	0.610	5.982	29.267	65.674	87.251	95.260	98.061	99.120	99.564
Tl	6.11	0.000	0.000	0.002	0.074	1.087	8.292	32.961	66.410	86.374	94.469	97.571	98.834	99.394
V	6.75	0.000	0.000	0.000	0.018	0.354	3.588	19.808	53.979	81.222	92.917	97.151	98.740	99.390
W	7.86	0.000	0.000	0.000	0.001	0.016	0.245	2.148	11.760	37.696	68.691	86.962	94.633	97.659
Xe	12.13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.060	0.416	2.167	8.656	25.412
Y	6.22	0.000	0.000	0.003	0.112	1.600	11.107	38.083	68.720	86.101	93.594	96.776	98.223	98.938
Zn	9.39	0.000	0.000	0.000	0.000	0.000	0.009	0.116	0.962	5.458	20.844	49.370	75.334	89.300
Zr	6.63	0.000	0.000	0.001	0.041	0.755	6.976	31.982	67.922	88.139	95.560	98.168	99.162	99.580

With: $n_e = 1 \times 10^{21} \text{ m}^{-3}$, $k = 1.3806504 \times 10^{-23} \text{ JK}^{-1}$, $h = 6.63606896 \times 10^{-34} \text{ Js}$

Table S1: Degrees of ionization expressed as $M^+/(M^+ + M^0) \times 100$ (%)

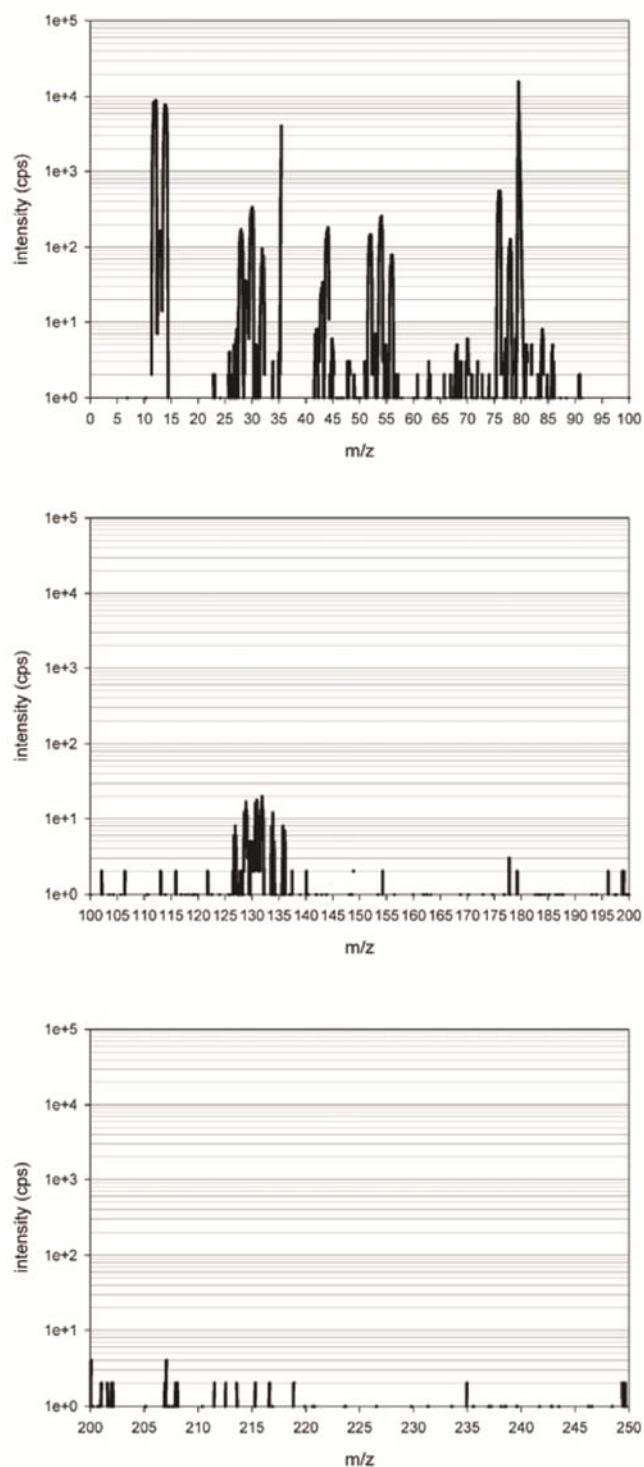


Fig. S1 Mass spectrum of methane/argon background of the mass range m/z 7-220. Major background masses such as m/z 12 and m/z 40 are excluded.