Ionization, Entropy, and Dark Matter

By Eugene A. Ellis (Sept. 2016)

Energy level data was compiled in 1970 by Charlotte E. Moore; NBS-34, Ionization Potentials and Ionization Limits Derived from the Analysis of Optical Spectra. The defined ionization potential of an element is a measure of its ability to enter chemical reactions requiring ion formation or donation of electrons and is related to the nature of the chemical bonding in compounds formed by elements. Ionization, however, encompasses more than this definition. The ionization potentials and limits shown in Table 1 are energy levels in electron volts that correspond to the electron activity of the elemental atoms. One electron volt (1eV) is the amount of energy an electron gains moving through a potential of one volt in a vacuum. For each element, the largest number in each row is the energy limit in electron volts. When reading the chart from right to left (from past to present) it marks the first time the element is able to enter a reaction or bond. Prior to the time of this first ionization, the element is neutral because no electrons are detected or interacting as an electromagnetic force. Since the mass of an element is unchanging before the time of its highest ionization (potential) and the presence of such masses are not analytically revealed, those masses would be classified as **dark matter**.

The time an element first ionizes raises another question…whether the electrons appear singularly at each ionization level or all at once at the highest level? Resolution of this "unknown" could alter our present concept of the quantum-mechanical model of the atom.

An anomaly is noted when the small incremental jumps between energy levels become large jumps as highlighted in Table IR. These large jumps create a pattern and indicate something different occurring within the atoms. These occurrences, as presented in the IGE 8-Element Supplement, are attributed to **entropy** for when the elemental atoms are heating.

Knowing the time as related to the spectrum, changes what we think we know about our planet and the universe. Before calcium ionized for the first time ~8800 MYA, all elemental matter was **dark matter**. Depending upon how electrons emerge, water did not exist until oxygen ionized either ~1400 MYA or ~1200 MYA. Hydrocarbons probably did not arrive until ~800 MYA and all hydrogen existed as **dark matter** until ~ 22 MYA when it ionized for the first time and could join to become a molecule (H_2).

When the growing and heating phases of the eight elements that comprise 98.8% of Earth's matter are plotted as in Figures 1R and 2R, it is obvious the planet was primarily heating for the first 3000-3500 million years of its existence. During this time there was very little change in the size of the planet. Molten crustal rock solidified after water arrived as the cooling agent ~1200 or ~1400 MYA. Consequently, radiometric dating only extends back to such time when rock solidified. The chart also indicates exponential growth essentially beginning ~700-800 MYA.

All of the above result from when the energy decay rate (1eV/1.6 MY) is applied to the Ionization Potentials and Ionization Limits of NBS-34 and illustrates:

Ionization is a mechanism conditionally allowing elements to join at certain energy levels.

Ionization is the mechanism that emerges the electrons to make **dark matter** spectra visible.

Ionization also is a switch-like mechanism that directs energy to convert to **mass** or to **entropy** that grows and heats elemental atoms.

TABLE 1R

NBS-34 Table 1, pages 2 and 3 -Ionization Potentials and Limits (in eV) (First 30 Elements only)

Z	Element	Spectrum																					*Z*
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	
1	H	13.598																					1
2	He	24.587	54.416																				2
3	Li	5.392	75.638	122.451																			3
4	Be	9.322	18.211	153.893	217.713																		4
5	B	8.298	25.154	37.93	259.368	340.217																	5
6	C	11.26	24.383	47.887	64.492	392.077	489.981																6
7	N	14.534	29.601	47.448	77.472	97.888	522.057	667.029															7
8	O	13.618	35.116	54.934	77.412	113.896	138.116	739.315	871.387														8
9	F	17.422	34.97	62.707	87.138	114.24	157.161	185.182	953.886	1103.09													9
10	Ne	21.564	40.962	63.45	97.11	126.21	157.93	207.27	239.09	1195.8	1362.16												10
11	Na	5.139	47.286	71.64	98.91	138.39	172.15	208.47	264.18	299.87	1465.09	1648.66											11
12	Mg	7.646	15.035	80.143	109.24	141.26	186.5	224.94	265.9	327.95	367.53	1761.8	1962.61										12
13	Al	5.986	18.828	28.447	119.99	153.71	190.47	241.43	284.59	330.21	398.57	442.07	2085.98	2304.08									13
14	Si	8.151	16.345	33.492	45.141	166.77	205.05	246.52	303.17	351.1	401.43	476.06	523.5	2437.68	2673.11								14
15	P	10.486	19.725	30.18	51.37	65.023	220.43	263.22	309.41	371.73	424.5	479.57	560.41	611.85	2816.94	3069.76							15
16	S	13.36	23.33	34.83	47.3	72.68	89.049	280.93	328.23	379.1	447.09	504.78	564.65	651.63	707.14	3223.84	3494.1						16
17	Cl	12.967	23.81	39.61	53.46	67.8	97.03	114.193	348.28	400.05	455.62	529.26	591.97	656.69	749.74	809.39	3658.43	3946.19					17
18	Ar	15.759	27.629	40.74	59.81	75.02	91.007	124.319	143.456	422.44	478.68	538.95	618.24	686.09	755.73	854.75	918	4120.78	4426.11				18
19	K	4.341	31.625	45.72	60.91	82.66	100	117.56	154.86	175.814	503.44	564.13	292.09	714.02	787.13	861.77	968	1034	4610.96	4933.93			19
20	Ca	6.113	11.871	50.908	67.1	84.41	108.78	127.7	147.24	188.54	211.27	591.25	656.39	726.03	816.61	895.12	947	1087	1157	5129.05	5469.74		20
21	Se	6.54	12.8	24.76	73.47	91.66	111.1	138	158.7	180.02	225.32	249.832	685.89	755.47	829.79	926							21
22	Ti	6.82	13.58	27.491	43.266	99.22	119.36	140.8	168.5	193.2	215.91	265.23	291.497	787.33	861.33	940.36							22
23	V	6.74	14.65	29.31	46.707	65.23	128.12	150.17	173.7	205.8	230.5	255.04	308.25	336.267	895.58	974.02							23
24	Cr	6.766	16.5	30.96	49.1	69.3	90.56	161.1	184.7	209.3	244.4	270.8	298	355	384.3	1010.64							24
25	Mn	7.435	15.64	33.667	51.2	72.4	95	119.27	196.46	221.8	243.3	286	314.4	343.6	404	435.3	1136.2						25
26	Fe	7.87	16.18	30.651	54.8	75	99	125	151.06	235.04	262.1	290.4	330.8	361	392.2	457	489.5	1266.1					26
27	Co	7.86	17.06	33.5	51.3	79.5	102	129	157	186.13	276	305	336	379	411	444	512	546.8	1403				27
28	Ni	7.635	18.168	34.17	54.9	75.5	108	133	162	193	224.5	321.2	352	384	430	464	499	571	607.2	1547			28
29	Cu	7.726	20.292	36.83	55.2	49.9	103	139	166	199	232	266	368.8	401	435	484	520	557	633	671	1698		29
30	Zn	9.394	17.964	39.722	59.4	82.6	108	134	174	203	238	274	310.8	491.7	454	490	542	579	619	698	738	1856	30

NOTES:

1) The ionization potentials are in electron volts (eV) for each spectrum.

2) The elements are arranged in order of increasing atomic numbers, Z.

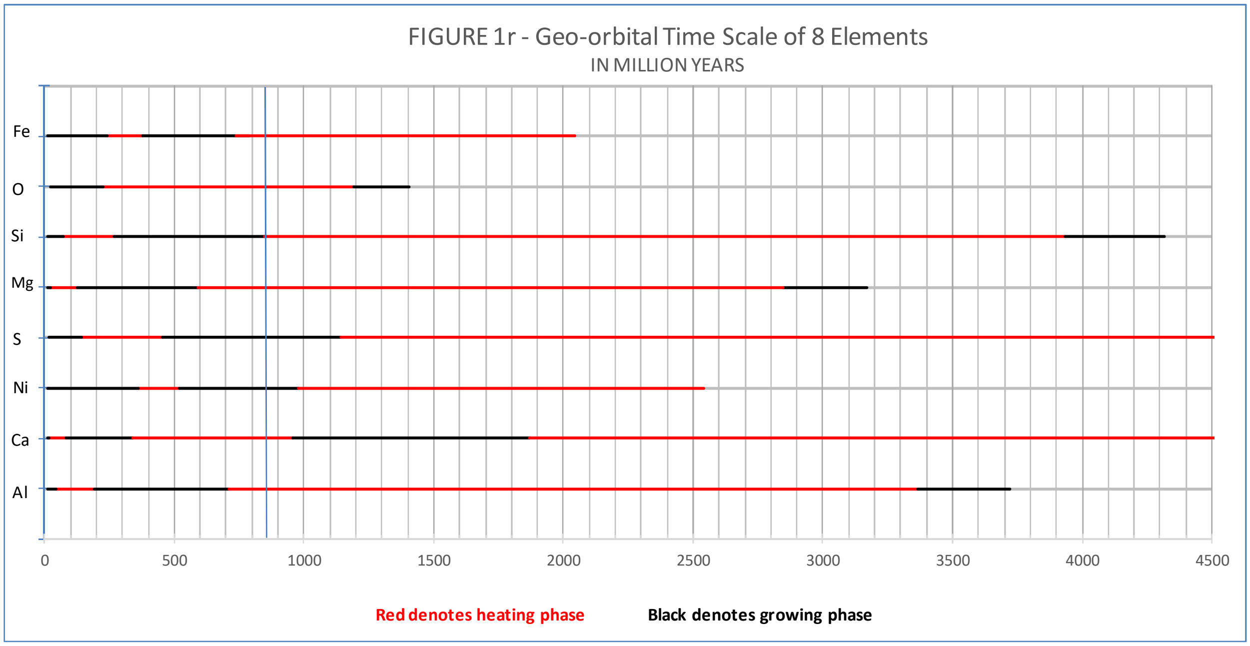
3) The successive stages of ionization are indicated at the heading of each column: I, denoting the first spectra (neutral atoms); II, second spectra (single ionized atoms}, etc.

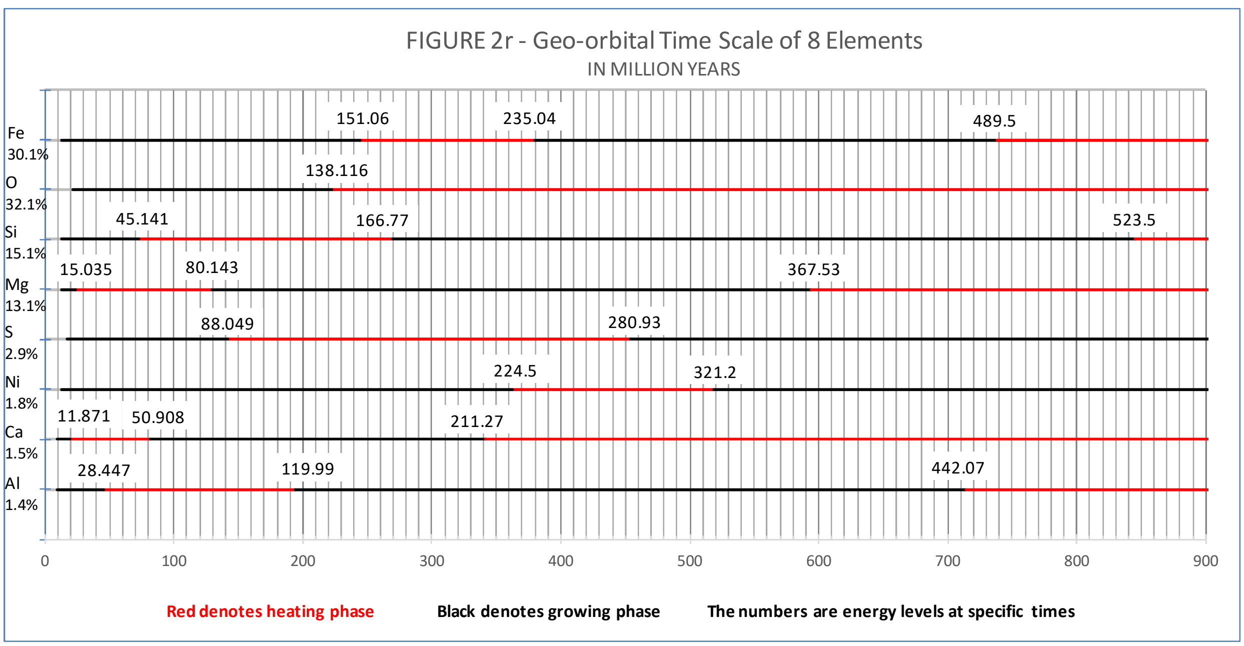
4) The amount of energy required to remove a single electron is based upon an ambient energy level the planet is experiencing at the present time. A billion years ago, that ambient level would have been very much higher.

5) Viewing the table, those higher energy levels would have been the time in the past the element ionizes. The highest limit, therefore would be the time an element first ionizes in a higher ambient.

6) Multiplying any level in Table 1R by 1.5952 produces the time of that level, e.g. oxygen was first able to bond at level VIII 1,390 MYA (1.5952 x

7) An anomaly surfaces when small incremental jumps of energy suddenly a become large jump as highlighted. See Table 3R and Figures 1R & 2R for the 8 elements of concern.





Earth's internal heat from radioactive decay is an addition to the heat from elemental decay.