

Active thermodynamic variations in a white plastic hydrocarbon (PVC) modifies the reflective spectrum in relationship to light-emitting electron shells/subshells

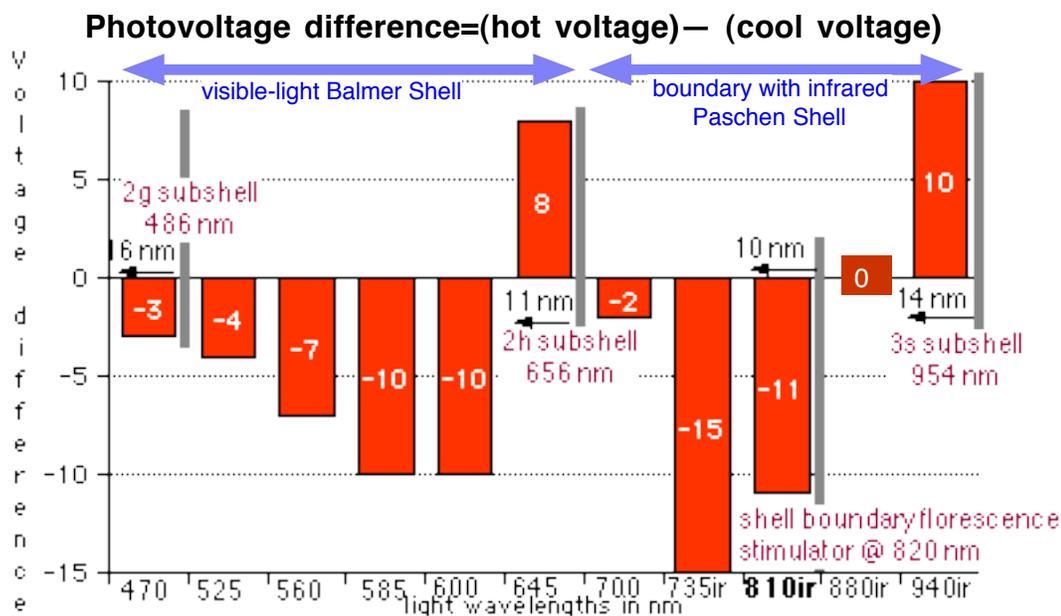
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SUMMARY: The reflective spectrum of white PVC can be varied in intensity by changing the temperatures within the material and this variance in intensity is explained by the quantum orbital structure of the hydrogen bonds. These data were measured by a reflectance spectrometer which is composed of a suite of single frequency diodes with the dependent “reflective intensity” variable measured by a photovoltaic light meter identifying the reflected-light photo-voltage produced by each diode.

The reflectance spectrometer in this experiment provides a suite of 11 single frequency light diodes which can measure reflectance capacities by the induced voltage of the light they cause to be reflected. The wavelengths of the single-frequency diodes range from “470 nanometers”— just below the “2g” subshell in the Balmer shell— through the “2h” subshell, across the boundary to the infrared Paschen shell and to just below the first Paschen “3s” subshell. Thus, the diode wavelengths can be related to three quantum orbital subshells (“2g,” “2h” and “3s”)¹ and to the florescence stimulating (negative radiation) of the Paschen-shell boundary at “820 nanometers.” Initially, a “12.4° F” variance between a “heated part” of a single piece of PVC and a “cool partially-insulated part” were compared. A portion of the PVC was heated using imbedded electronics from which a “cool portion” was partially insulated by a heat barrier. Initial tests showed a “cooler” portion reflective advantage, as measured by photo-voltages. The exceptions were diodes proximate to the lowest visible subshell and the first infrared subshell. Diodes most proximate to the visible “2h” and the infrared “3s” had the lowest overall reflectivity in their grouping.

Non-Energetic Temperature Influence on Reflectivity

Temperature Differential: “12.4° F”



Thermal State	470nm volts	525nm volts	560nm volts	585nm volts	600nm volts	645nm volts	700nm volts	735nm IR volts	810nm IR volts	880nm IR volts	940nm IR volts
Hot	701	710	686	720	703	678	707	643	683	657	626
Cool	704	714	693	730	713	670	709	658	694	657	616
var.=12.4°	-3	-4	-7	-10	-10	8	-2	-15	-11	0	10

¹ See *Four Dimensional Atomic Structure*: Paradigm Publishing, L. Dawson, 2013.

For non-energetic temperature differences, cooler PVC was more reflective by “44 p.volts”

The only increase in reflectivity provided by non-energetic, but “hotter,” PVC was for diode wavelengths most proximate to the “2g” and “3s” subshells. These diodes most proximate to the visible “2g” and the infrared “3s” also provided the lowest reflectivity for their respective frequency grouping. Overall, the 2g proximate diode (645 nm) showed a reflectivity of only 95.9% of the mean reflectivity of all diodes in the visible spectrum. This was the lowest reflectivity for the visible light grouping. Further testing of “energetic” temperature differentials (dynamic increases in temperature over test) revealed the “2g” proximate diode was further reduced in reflectivity and this further reduction was statistically significant.

Relationship between temperature and reflectivity explained by quantum electron orbital

These results are consistent with the quantum dimensional model of the electron orbital. Quantum orbitals are negations of subdivisions of the root frequency to which valence electrons can fall to entangle light of a sympathetic frequency. These orbitals are controlled by two separate energy factors. The first energy factor is a light-frequency orbital energy as supplied by the Schrodinger internal standing wave². This light-frequency orbital energy establishes the electron voltage of the subshell orbital. The second energy factor is independent of the frequency-related energy. It is a nuclear heat signature stored in the capacitance fields of the orbital subshells³.

The electron orbital subshells establish a capacitance field with the nucleus which stores heat energy. The amount of energy stored is a function of nuclear conditions (temperature). Stored nuclear thermal energy must adjust “the charge value” of the field in order to fit within the exact electron voltage provided by the frequency-related energy of the orbital subshell. The frequency-controlled eV of the field cannot be adjusted by nuclear energy infusions. Therefore, higher temperatures must increase the charge value of the field since they cannot adjust the electron voltage of the field. These increased charges can induce the electron to migrate to higher orbitals in order to entangle higher frequencies of greater electron voltages.

$$(Field - Charge) \uparrow = E \uparrow / eV(constant): (Field - Charge) > (electron elem. charge) = \uparrow (migration induction)^4$$

It is a known fact of physics that most of the “colors” in nature are mixtures of frequencies, not primary frequencies. Whereas a diode can give an exact primary frequency, that frequency can only be reflected by a hydrocarbon using a combination of orbitals. For example, two “2g” subshells (blue) and one “2h” subshell (red) reflect a primary frequency of 542 nanometers— a version of “green.” “White” hydrocarbons reflect all frequencies of light. They are “white:” precisely because they possess a greater number of hydrogen bonds (valence electrons) per molecule and this greater number can be combined and adjusted to reflectively entangle more frequencies.

Reflectivity increases for cooler hydrocarbons because the valence electrons of the hydrogen bonds are less “fixed” in higher quantum subshells and can migrate more easily

Photovoltage reflectivity can be changed by temperature because higher temperatures more firmly “hold” or “fix” light-entangling valence electrons in higher orbitals than do cooler temperatures. The reflective color of hydrocarbon polymers are established by the number of subshells available to the valence electrons. Hydrocarbons are “covalent molecules.”⁵ The electrons of the hydrogen bonds act as valence electrons for the whole of the molecule. Valence electrons in cooler material can more easily “fall” to the multiple orbital positions which are required to reflectively entangle multiple impinging light wavelengths.

Hotter hydrocarbons tend to “fix” valence electrons in higher orbitals because of the thermal energy stored in the capacitance fields of subshells⁶. Since each subshell has an exact electron voltage, as established by the light-frequency which the subshell entangles, any increase in stored field energy from material heat can only adjust the “charge value” of the field. Field charges which could be greater than the elementary charge for lower subshells tend to “fix” orbiting electrons into higher subshells.

In contrast, lower-temperature hydrocarbons have lower capacitance-field charges relative to the electron’s elementary charge. Therefore, the electrons are less “fixed” in higher orbitals and can more easily migrate to multiple orbitals required to entangle the full range of frequencies.

² *Four Dimensional Atomic Structure* ; Tab 1, 1-A and 2. Op. cit.

³ Ibid. Tab 3.

⁴ Ibid.

⁵ Standard organic chemistry.

⁶ See *Four Dimensional Atomic Structure*. Op. cit.

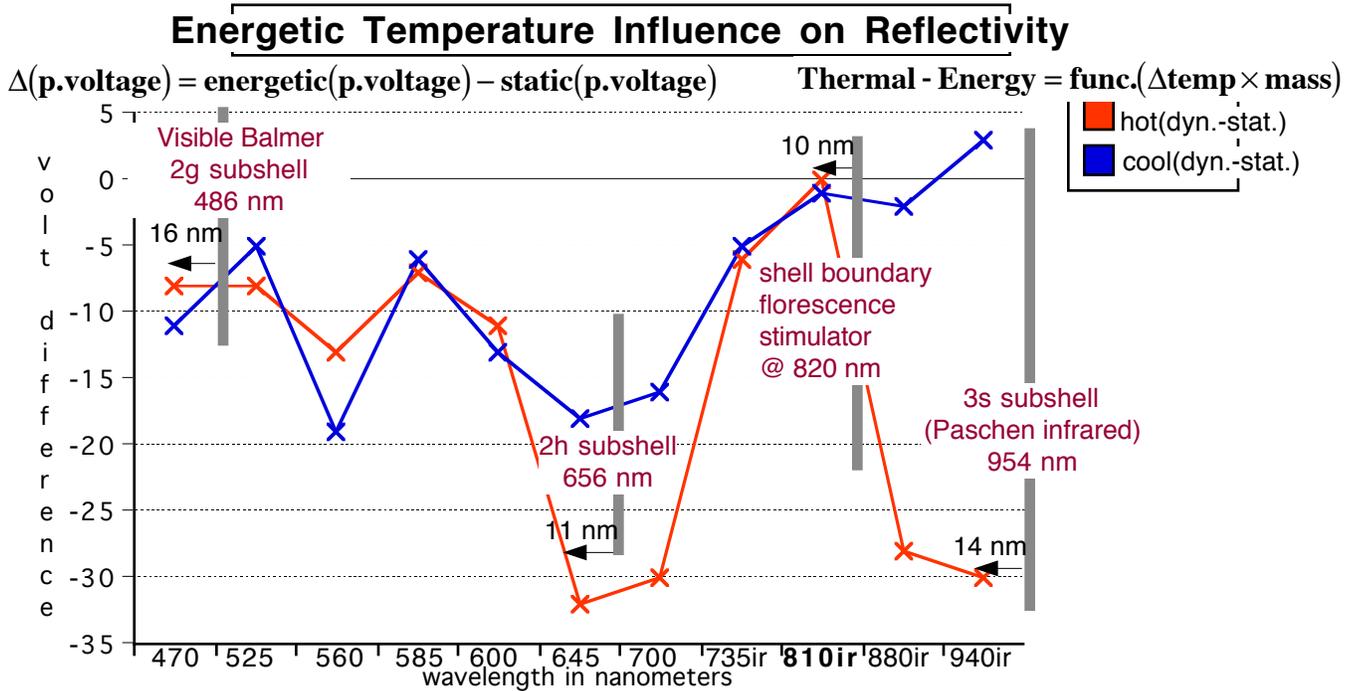
Energetic temperature changes influence reflectivity more than does a static heat difference

A second test supplied thermodynamically energetic temperature changes to the hot and cool sides of the white PVC. Over the period of measurement for the suite of diodes, the “hot” side was made to increase in temperature by “5.8° F” while the “cool” side increased in temperature by “2.8° F” (from ambient conditions). It was discovered energetic changes in temperature provided a much more dramatic influence upon reflectivity than did static differences in temperature.

This was proved by the fact that the cool side under dynamic heating had an immediate and continuous disadvantage in reflectivity in comparison with the cool side under static conditions. Even though the thermodynamically active cool side started at a lower temperature, it was immediately deficient in reflectivity in comparison to the static condition. For the “470 nm” diode, the thermodynamically active cool-side temperature was a lower “76.8” (static “78.7”), but still had an “11 photovoltage” deficiency.

Thermodynamic activity in the “cool side” of the PVC produced a reflectivity disadvantage of “-93 photovoltes” across the whole spectrum relative to the thermodynamically static “cool side.” Diode measurements for the thermodynamically active PVC began at “76.8° F” — or the static temperature (78.7° F) minus “0.9° F.” Diode measurements for the thermodynamically active PVC ended at “79.6° F” — or the static temperature (78.7° F) plus “0.9° F.” Despite the fact that the thermodynamically active temperature varied around the static temperature, thermodynamic activity always provided a reflective disadvantage in photovoltage when compared to the static temperature.

The photovoltage differences between the hot and cold sides of white PVC undergoing energetic heating compared to the same PVC with a static temperature difference



Raw Data

wavelength	470nm	525nm	560nm	585nm	600nm	645nm	700nm	735nm /IR	810nm /IR	880nm /IR	940nm /IR
hot dynamic initial temp. 99.7°	693	702	673	713	692	646	677	637	683	629	596
hot static/91.1°	701	710	686	720	703	678	707	643	683	657	626
cool dynamic initial temp. 76.8°	693	709	674	724	700	652	693	653	693	655	619
cool static/78.7°	704	714	693	730	713	670	709	658	694	657	616
diff. hot(dyn-stat)	-8	-8	-13	-7	-11	-32	-30	-6	0	-28	-30
diff. cool(dyn-stat)	-11	-5	-19	-6	-13	-18	-16	-5	-1	-2	3

Thermodynamic activity introduces a new factor in reflectivity suppression

Thermodynamic activity in the reflective material introduces a new condition governing reflective suppression. Static temperatures which may be stored in a subshell's capacitance field only addresses that subshell's potential to tolerate an excess field-charge relative to the elementary charge of the orbiting electron. In contrast, energetic changes in temperature must address the subshell's capacity to resist forced migration to higher subshells. A subshell's capacity to tolerate excess field charge and its capacity to resist forced migration are not the same thing. The "2h" subshell has a great potential to tolerate excess field charge and yet has little resistance to forced migration.

Energetic field-pressure against orbital electron voltages

If the nuclear thermal energy stored in a subshell's capacitance field is greater than the subshell's orbital energy, then one of two things must occur. Either the electron must migrate to a higher subshell with higher energy and greater electron voltage, or the subshell must tolerate an increased field-charge relative to the electron's elementary charge.

However, both "*tolerance of excess charge*" and "*resistance to migration*" are partially controlled by subshells— as determined by the subshell's position within the shell. These positional characteristics result because the subshell's electron voltage must interact with shell electron voltage.

Because of the quantum mathematics governing electron subshell orbitals⁷, all subshells are governed by the range of electron voltages across the shell which contains the subshell. There is an interaction between subshell position within the shell and shell electron voltages. This interaction establishes "*tolerance of excess charge*" as the absolute difference in electron voltage between the shell and the subshell. The lowest subshell always provides the greatest difference and will have the greatest tolerance of excess charge.

The interaction between subshell position and shell electron voltage also provides "*resistance to migration*". For every subshell, electron advances to higher subshells must overcome the remaining electron voltage pressure from its current position to the end of the shell. To drop back to a lower subshell, the electron must overcome the difference between its shell electron voltage pressure and the shell electron voltage pressure for the lower subshell to which it is inclining. That is, migration is controlled by competing pressures against advance and back pressure against retreat. If the pressure against advance is less than the back-pressure against retreat, then the subshell has a "*lower resistance to upward migration*" than it would if the forward pressure and back-pressure are equal.

Increasing the heat energy stored in the subshell's capacitance field (thermodynamic activity) creates a bias towards upward migration. Thermodynamically active (energetic) nuclear heat signatures accelerate excessive field-charges relative to elementary charges. The acceleration of excessive field-charges by energetic temperature changes will provide increasing pressure towards migration to higher subshells. Under thermodynamically active conditions, electrons are inclined towards subshells with *lower resistance to upward migration*."

The lowest "2h" subshell in the Balmer (visible frequency) shell has the highest cross-shell electron voltage— greatest "*tolerance of excess charge*" — coupled with equal "pressure/ back-pressure"— greater "*resistance to upward migration*".

(Electron-voltage variance across the shell for descending subshells in the Balmer "2" shell)= ("s" electron voltage)- (subshell eV) (NOTE: Variances across the Balmer shell always equal "s" subshell electron voltages for lower shells; Back pressure is last subshell in succeeding shell.	Sub-shell	Multiple of next highest subshell
(s-p)=0.065 eV="7s" eV; backpressure="6s"—"7s"="6p" eV=0.1003 eV	2p	N.A.
(s-d)=0.165 eV="6s" eV; backpressure="5s"—"6s"="5d" eV=0.166 eV	2d	2.54(s-p) eV
(s-f)=0.332 eV="5s" eV; backpressure="4s"—"5s"="4f" eV=0.306 eV* •anomaly	2f	2.01(s-d) eV
(s-g)=0.638 eV="4s" eV; backpressure="3s"—"4s"="3g" eV=0.661 eV	2g	1.92*(s-f) eV
(s-h)=1.299 eV= "3s" eV; backpressure= "3s" eV The cross-shell eV resisting higher migration now equals backpressure eV	2h	2.04(s-g) eV

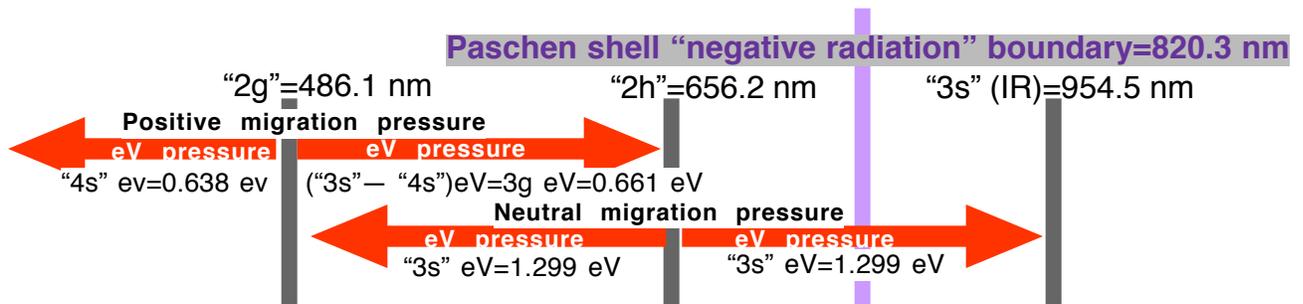
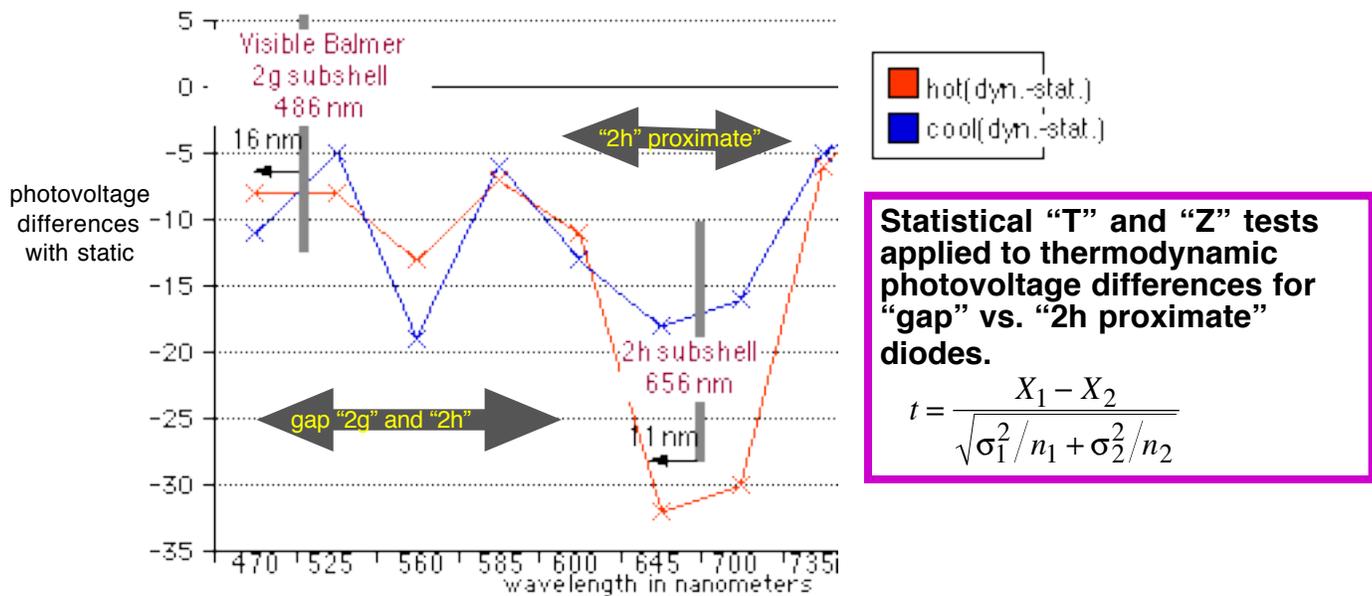
⁷ The Quantum Dimension: L. Dawson. Paradigm Publishing. 2009. See Chant. 1.

The data set comparing the impact of two different levels of thermodynamic activity upon photovoltaic reflectivity identifies the reduced responsiveness to energetic thermal conditions for the last “2h” subshell in comparison to the “2g.”

For the diodes located in the “gap” between the “2g” and the “2h” (470 nm, 525 nm, 560 nm, 585 nm and 600 nm) energetic thermal conditions reduced reflectivity much less than did energetic thermal conditions for diodes most proximate the last “2h” subshell. Energetic conditions for the low temperature samples reduced “gap” photovoltage reflectivity by an average of “-10.8 photo-volts.” Energetic conditions for high temperature samples reduced “gap” reflectivity by “-9.4 photo-volts.”

In contrast, the diodes most proximate to the “2h” subshell (645 nm and 700 nm) provided a further reduction in photovoltage which proved to be statistically significant. For low thermodynamic activity, the “2h proximate” diodes recorded a mean photovoltaic reduction of “-17 photo-volts” (compared to a mean “-10.8” for the “gap” diodes). The greatest reduction in photovoltage, however, was provided by “high-temp.” energetic conditions for the “2h proximate” diodes. Proximate diodes saw a photovoltage decrease of an average “-31 photo-volts” (compared to a mean of “-9.4” for the “gap” diodes).

Statistically significant photovoltage disadvantages provided by “2h” vs. “2g” subshell⁸ (dynamic photo-volts) minus (static photo-volts)



thermo p.volts minus static p.volts	Gap 2g to 2h n=5 diodes		2h proximate n=2 diodes		Statistical tests	
	$\bar{X}_{gap} = mean$	$\sigma^2 / n = Var^2$	$\bar{X}_{2hprox} = mean$	$\sigma^2 / n = Var^2$	$t = \frac{X_1 - X_2}{\sqrt{\sigma_1^2/n_1 + \sigma_2^2/n_2}}$	
high thermodyn	-9.4	5.04	-31	1	t=8.79; 6df	< 0.001
low thermodyn	-10.8	25.76	-17	1	t=1.20; 6df	< 0.15
high+low	-10.1	0.49	-24	49	Z=1.99 ⁹	< 0.025

⁸ “Power of the Paired Z test” Wikipedia: Paired difference test. Application: stat test 2h to 2a.pdf. SRNRI publication.

Discussion

Some wavelength-specific reflectivity for white PVC is reduced by the energetic application of heat and these heat-induced changes in reflectivity are determined by the characteristics of the orbital subshells. These data show— with near certainty— that wavelengths proximate to the last subshell available for the entanglement of visible light, (the “2h” subshell) can be reduced in reflectivity by as much as 4.7% by the energetic application of heat. These measured reflectivity losses for “2h proximate” wavelengths⁹ would have occurred by chance only once in many thousands of similar measurements.

These data are explained by the fact that the “2h” subshell has very unique reflective characteristics due to its position as the last subshell in the Balmer “2” visible-light shell. As the last subshell in the “2” shell, the “2h” has the highest cross-shell electron voltage which gives it the highest “*tolerance of excess charge*” of any other subshell in the Balmer. Higher static (non energetic) temperatures in white PVC recorded greater reflectivity for “2h” proximate diodes precisely because the “2h” could tolerate more valence electrons of excess charge from the PVC molecules.

However, when the PVC temperature differential became thermodynamically active (energetic) the situation changed drastically. Energetic heat, that is heat which is increasing over time, accelerates excess field-charge against subshell voltage deficiencies and provides a bias towards upward migration. The “2h” is non-supportive of migration because of its “*neutralized migration pressures.*” Therefore, fewer PVC valence electrons under active thermodynamic energy will fall into the “2h,” thus reducing reflectivity photovoltages. The reduction in photovoltage for “2h” proximate diodes between the “hot” static condition and “hot energetic” condition produced a “t test” probability value so far below the lowest probability provided by standard tables that it could not even be estimated. That the “2h” subshell operates as predicted by the quantum dimensional model of the electron orbital is a statistical certainty.

⁹ Only “high thermodynamic activity” was undergoing the continuous application of heat and it is the condition which provided great statistical reliability for measured loss in reflectivity. “Low thermodynamic activity” was “active” only in relationship to changing ambient conditions. It was not made “active” by the controlled application of heat and its loss of reflectivity was not statistically significant.