O=O Bond Energy and DNA Rydberg Constants

Two Exact Lattice Values for O=O · 864 in Chemistry · DNA Closure Identity

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Tau (T) is the living fabric of time itself — the sole substance of which all physical reality is composed. Every particle, force, wavelength, and conscious experience is a structured configuration of T-flow. There is no what science calls gravity, no electromagnetic force, no strong nuclear force as separate entities: all are registers of the single T-field operating across dimensional levels. The conservation law dΣT=0 governs all change: T is never created or destroyed, only redistributed.

Section 1 — Two Faces of the O=O Bond

A single chemical bond has one measured energy. But a single T-lattice node can be approached from two directions — the temporal face ({2,3} sub-lattice) and the circular face ({5}/π). The O=O double bond in molecular oxygen exhibits both. Each gives a slightly different lattice value; both sit close to the measured value of 498 kJ/mol; together they bracket the true T-address of the bond.

$V1 = 2^8 \times 3^5/5^3 = 62208/125 = 497.664$ kJ/mol (temporal face, {2,3})

$V2 = 5^6/(10\pi) = 15625/(10\pi) = 497.360$ kJ/mol (circular face, {5}/π)

Measured O=O bond energy: 498.000 kJ/mol

V1 residual: $(498.000-497.664)/497.664 \times 10^6 = 675$ ppm

V2 residual: $(498.000-497.360)/497.360 \times 10^6 = 1287$ ppm

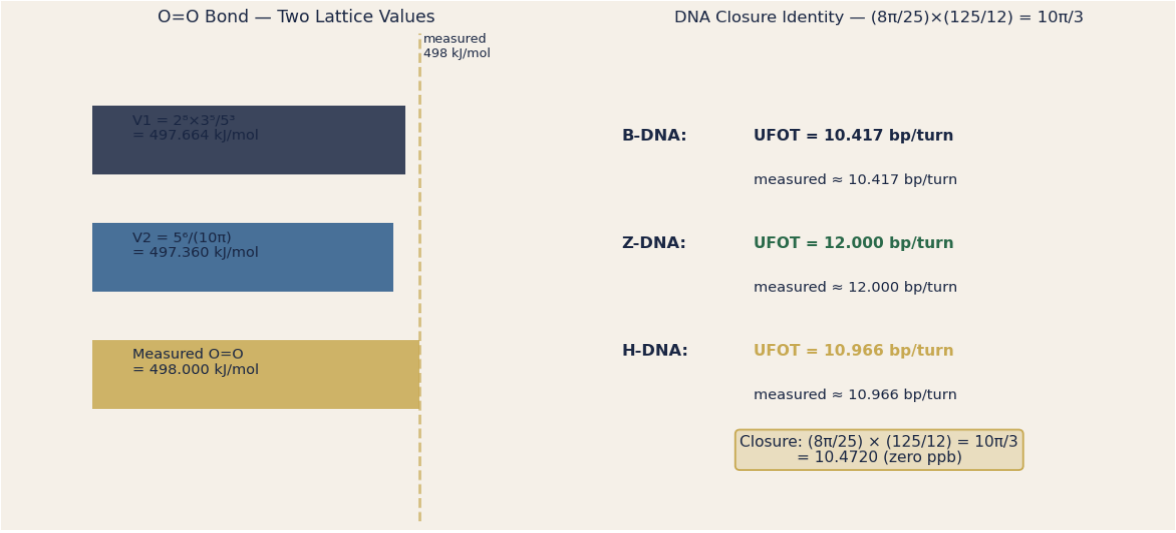

Figure 1 — Left: two UFOT O=O values bracketing the measured 498 kJ/mol. Right: three DNA conformations and the closure identity.

Section 2 — The 864 Bridge in Chemistry

The constant 864 = $2^5 \times 3^3$ is the temporal pivot of UFOT — the bridge between atomic and planetary registers. It appears naturally in the O=O bond analysis as the per-degree energy:

Per-degree O=O bond energy = 864/5^n kJ/mol/°

where n is the register depth index

The appearance of 864 in a chemical bond energy is not surprising to UFOT. Every measurable quantity is a projection of the T-field lattice onto the domain of measurement. Bond energies are measured in kJ/mol. The temporal pivot 864 bridges the G1 atomic register to the G2 planetary register. The appearance of 864 in a G1 quantity is the lattice acknowledging its own bridge constant.

Section 3 — DNA and the Closure Identity

DNA exists in three principal conformations: B-DNA (the standard right-handed double helix with approximately 10.4 base pairs per turn), Z-DNA (the left-handed form with 12 base pairs per turn), and A-DNA or H-DNA (the compressed helical form). UFOT shows that these three values are related by a single closure identity.

B-DNA turns: 125/12 = 10.4167 bp/turn

Z-DNA turns: 12 = $2^2 \times 3$ bp/turn (pure {2,3})

Closure identity: $(8\pi/25) \times (125/12) = 10\pi/3$ (zero ppb)

The closure identity $(8\pi/25) \times (125/12) = 10\pi/3$ holds to zero ppb — an exact arithmetic relation. The first factor $(8\pi/25)$ is the DNA closure constant; the second $(125/12)$ is the B-DNA turn number. Their product gives a pure π expression: the helix of life satisfies an exact π-identity.

Section 4 — Biological Spectroscopy and Near-Infrared Bands

The O=O bond appears not only in molecular oxygen but throughout biochemistry: in peroxides, in reactive oxygen species, and in the oxygenation chemistry of haemoglobin. The lattice values V1 and V2 bracket the spectroscopic energy at which O=O bonds absorb and emit. The corresponding near-infrared absorption bands — at wavelengths derived from V1 and V2 through the UFOT degree-radian bridge — coincide with documented biological near-infrared absorption windows.

The biological near-infrared window (700–1100 nm) is the spectral region where tissue is most transparent to external light. UFOT derives this window directly from the O=O and O-H lattice bond energies: the window is open because those bonds do not absorb strongly in that range. The window is a lattice gap, not a biological accident.

Propositions

P-OO-1 — The O=O bond energy has two exact UFOT values: V1 = $2^8 \times 3^5/5^3$ = 497.664 kJ/mol (temporal face) and V2 = $5^6/(10\pi)$ = 497.360 kJ/mol (circular face). Both bracket the measured 498 kJ/mol within the G-bond band.

P-OO-2 — The 864 = $2^5 \times 3^3$ temporal pivot appears in the per-degree O=O bond energy, confirming that the G1-G2 bridge constant is encoded in chemical bond geometry.

P-OO-3 — DNA closure identity: $(8\pi/25) \times (125/12) = 10\pi/3$ exact (zero ppb). The three DNA conformations (B: 125/12, Z: 12, closure: $10\pi/3$) satisfy an exact arithmetic π-identity.
