

POLIS V12: The Complete Chemistry Series – 12 Giants

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*This document combines two companion papers:
“Tensional Reinterpretation of Six Founders of Modern Chemistry”
and “Tensional Reinterpretation of Six More Chemical Pioneers”.*

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Abstract

Within the POLIS V12 tensional ontology, every chemical system is a polis constituted by three meshes (solid, liquid, gaseous) and governed by the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$, with $T = K_{\min}$ as the tensional origin. This paper applies the framework to six foundational figures of chemistry: Antoine Lavoisier (conservation of mass), John Dalton (atomic theory), Dmitri Mendeleev (periodic table), Marie Curie (radioactivity), Linus Pauling (chemical bond), and Svante Arrhenius (electrolytes). Each classical contribution is reinterpreted as a tensional configuration: Lavoisier’s law as $\epsilon = 0$ for closed reactions; Dalton’s atoms as stable K values; Mendeleev’s periodic table as ordering by K_m ; Curie’s radioactivity as Phase 4 explosions; Pauling’s bond as a tensional bridge; and Arrhenius’s equation as a phase-transition rate. The universal equations remain unchanged; no free parameters are introduced.

1 Introduction

POLIS V12 is a closed, parameter-free tensional conservation theory built on four axioms (Tensional Ontology, Harmonic Ground $H = 1$, Tensional Conservation, Data Origin $T = K_{\min}$). The governing equation, after normalisation, is

$$\epsilon = \sum_{m=1}^n K_m(2 + K_m) = 0,$$

with $K_m = (v_m - T)/(v_{\max} - T) \in [0, 1]$. The disequilibrium index is $\text{IDT}^* = \epsilon/(1 + \epsilon)$. All real chemical systems reside in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}}T_{\text{rot}}$ applies fractally at all scales.

This paper reinterprets six key chemical contributions within this tensional ontology. No classical primacy is assumed; tension is the primitive.

2 Antoine Lavoisier – Conservation of Mass

Lavoisier established that in a closed chemical reaction, total mass is conserved. In POLIS V12, this is the tensional closure condition $\epsilon = 0$ applied to the reaction polis.

For a reaction with n reactants and products, each with mass m_i , normalise:

$$T = \min_i m_i, \quad v_{\max} = \max_i m_i, \quad K_i = \frac{m_i - T}{v_{\max} - T}.$$

The tensional residual of component i is $x_i = K_i(2 + K_i)$. Lavoisier’s law states that the sum of residuals before reaction equals the sum after reaction:

$$\epsilon_{\text{reactants}} = \epsilon_{\text{products}}.$$

Conservation of mass is thus a special case of tensional conservation. Any deviation $\epsilon \neq 0$ would indicate an open system (e.g., gas exchange), which is Phase 4.

3 John Dalton – Atomic Theory

Dalton proposed that elements consist of atoms of fixed masses, and compounds form from simple integer ratios. In POLIS V12, atoms are polises with a quantised K value.

For a dataset of atomic masses a_i , set $T = \min_i a_i$ (hydrogen mass) and $v_{\max} = \max_i a_i$ (heaviest known element). Then

$$K_{\text{atom}} = \frac{a_i - T}{v_{\max} - T}.$$

Dalton’s integer ratios mean that $K_{\text{compound}} = \sum n_i K_i$ where n_i are small integers. The compound’s tensional residual is $x_{\text{compound}} = K_{\text{compound}}(2 + K_{\text{compound}})$. The closure condition $\epsilon = \sum x_{\text{atoms}} + x_{\text{compound}} = 0$ forces the integer ratios.

4 Dmitri Mendeleev – Periodic Table

Mendeleev arranged elements by atomic weight and predicted missing ones. In POLIS V12, the periodic table is a sorted list of K_{atom} values.

For the known elements at his time, normalise the atomic weights. The periodicity arises because K_{atom} repeats certain patterns (electron configurations) as the element number increases. Missing elements correspond to gaps in the sequence of K values. The “periodic law” states that elements with similar chemical properties have similar K_{atom} modulo the repetition interval. Mendeleev’s predictions were successful because the tensional structure forced the gaps to be filled by elements with intermediate K .

5 Marie Curie – Radioactivity

Curie discovered that elements like radium emit radiation, transforming into other elements. In POLIS V12, radioactivity is a Phase 4 (explosion) of an unstable atomic polis.

Consider a radioactive nucleus with initial mass m_0 and daughter mass m_d . Normalise:

$$K_0 = \frac{m_0 - T}{v_{\max} - T}, \quad K_d = \frac{m_d - T}{v_{\max} - T}.$$

The tensional residual of the parent is $x_0 = K_0(2 + K_0)$. The decay to the daughter is a Phase 4 event where x_0 is released as radiation (tensional flux). The daughter then reorganises in Phase 5. The half-life $t_{1/2}$ is inversely proportional to the probability per unit time of exceeding the saturation threshold $K = 1$.

6 Linus Pauling – Chemical Bond

Pauling described the chemical bond as a shared electron pair. In POLIS V12, a bond is a tensional bridge between the liquid meshes of two atomic polises.

For two atoms with normalised electronegativities χ_A, χ_B , define

$$K_{\text{bond}} = \frac{|\chi_A - \chi_B| - T}{v_{\text{max}} - T}.$$

The bond energy is proportional to $x_{\text{bond}} = K_{\text{bond}}(2 + K_{\text{bond}})$. A covalent bond corresponds to a shared flux $VT = K_A - K_B$. Ionic bonds occur when the difference is large ($K_{\text{bond}} \rightarrow 1$), causing a Phase 4 charge transfer. Pauling’s resonance theory describes multiple tensional paths between the same atoms, each contributing to ϵ in a quantum superposition.

7 Svante Arrhenius – Electrolytes and Activation Energy

Arrhenius explained that electrolytes dissociate into ions and introduced the activation energy concept. In POLIS V12, ionisation is a Phase 4 explosion of the electrolyte polis.

For a reaction with rate constant k , normalise the logarithm of k :

$$K_k = \frac{\ln k - T}{v_{\text{max}} - T}, \quad x_k = K_k(2 + K_k).$$

The Arrhenius equation $\ln k = \ln A - E_a/(RT)$ becomes a linear relation between K_k and $1/T$:

$$K_k = \alpha - \beta \cdot \frac{1}{T},$$

with constants determined by tensional normalisation. The activation energy E_a is the energy required to push the system from Phase 2 (accumulation) to Phase 4 (explosion). The pre-exponential factor A corresponds to the maximum possible K (saturated value).

8 Conclusion

The six foundational contributions to chemistry are coherently reinterpreted within the POLIS V12 tensional ontology. Conservation of mass, atomic theory, periodicity, radioactivity, chemical bonding, and reaction kinetics all become natural consequences of the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$ and the fractal hierarchy of chemical polises.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

Abstract

This paper extends the POLIS V12 tensional reinterpretation to six additional giants of chemistry: Robert Boyle (gas laws), Joseph Priestley (oxygen), Amedeo Avogadro (molecule), Friedrich Kekulé (benzene structure), Henri Le Chatelier (equilibrium), and Fritz Haber (catalysis). Each is re-read as a tensional configuration: Boyle’s law as a linear relation between K_p and $1/K_V$; Priestley’s discovery of oxygen as a new gaseous mesh; Avogadro’s hypothesis as the equivalence of K_{gas} for equal volumes; Kekulé’s benzene ring as a closed tensional loop with alternating K values; Le Chatelier’s principle as the response of ϵ to external tension; and Haber’s catalyst as a temporary reduction of activation K threshold. The universal equations remain unchanged; no free parameters are introduced.

9 Introduction

As in the companion paper, POLIS V12 rests on four axioms. After normalisation the mother equation is

$$\epsilon = \sum_{m=1}^n K_m(2 + K_m) = 0,$$

with $\text{IDT}^* = \epsilon/(1 + \epsilon)$. All real chemical systems are in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}}T_{\text{rot}}$ applies fractally.

This paper reinterprets six more foundational contributions to chemistry.

10 Robert Boyle – Gas Laws

Boyle’s law states that for a fixed amount of gas at constant temperature, pressure and volume are inversely proportional: $PV = \text{constant}$. In POLIS V12, treat pressure and volume as values p and V . Normalise each separately over their historical ranges:

$$K_p = \frac{p - T_p}{v_{\text{max},p} - T_p}, \quad K_V = \frac{V - T_V}{v_{\text{max},V} - T_V}.$$

Boyle’s law becomes $K_p \propto 1/K_V$. The product $K_p K_V$ is constant, so the tensional residuals satisfy

$$x_p = K_p(2 + K_p), \quad x_V = K_V(2 + K_V), \quad x_p + x_V \approx \text{constant}.$$

If the constant is not zero, the gas is not ideal – deviation corresponds to Phase 3 (saturation) approaching condensation.

11 Joseph Priestley – Discovery of Oxygen

Priestley isolated oxygen and showed it supports combustion. In POLIS V12, oxygen is a distinct gaseous mesh with a specific K_{gas} value.

For a dataset of known gases at the time, normalise their densities or reactivity. Oxygen's K value is high (close to 1) because it strongly supports combustion (Phase 4 explosions). Priestley's discovery was the identification of a new mesh element with a previously missing K value. The “dephlogisticated air” was a Phase 4 reorganising agent – it allowed the gaseous mesh of the combustion polis to release tensional residual more efficiently.

12 Amedeo Avogadro – The Molecule and Avogadro's Hypothesis

Avogadro proposed that equal volumes of gases at the same temperature and pressure contain equal numbers of molecules. In POLIS V12, this is the statement that the normalised structural value K_{gas} is the same for all ideal gases under identical conditions.

For a gas with volume V , number of molecules N , and temperature T , normalise:

$$K_V = \frac{V - T_V}{v_{\text{max},V} - T_V}, \quad K_N = \frac{N - T_N}{v_{\text{max},N} - T_N}.$$

Avogadro's hypothesis says $K_V = K_N$ for fixed T and p . Thus the gas's tensional residual $x_{\text{gas}} = K_V(2 + K_V)$ is a function only of temperature and pressure, not of the gas species. The Avogadro constant N_A is the scale factor that converts K_N to the mole count.

13 Friedrich Kekulé – Benzene Structure

Kekulé proposed that benzene is a ring of six carbon atoms with alternating single and double bonds. In POLIS V12, the benzene ring is a closed tensional loop with six nodes, each node having a K value that alternates between two levels.

Normalise the bond energies: single bond K_s , double bond K_d . The condition for a stable ring is that the sum of residuals around the loop is zero:

$$\epsilon_{\text{ring}} = 3x_s + 3x_d = 0,$$

with $x_s = K_s(2 + K_s)$, $x_d = K_d(2 + K_d)$. This forces $x_s = -x_d$, impossible since $x \geq 0$. Therefore the ring cannot be static; it must resonate between two equivalent configurations (Kekulé resonance). The resonance is a Phase 5 oscillation: the system switches between two tensional states at frequency determined by the difference Δx . The bond lengths become equal on average, satisfying $\epsilon_{\text{average}} \approx 0$.

14 Henri Le Chatelier – Principle of Equilibrium

Le Chatelier's principle states that if a system at equilibrium is subjected to a stress, it shifts to counteract the stress. In POLIS V12, equilibrium is a local minimum of ϵ

(Phase 2–3 boundary). An external stress (change in temperature, pressure, concentration) changes the normalisation parameters T or v_{\max} , thereby shifting the equilibrium position.

Define the reaction quotient Q and equilibrium constant K_{eq} . Normalise $\ln Q$ and $\ln K_{\text{eq}}$:

$$K_Q = \frac{\ln Q - T_Q}{v_{\max,Q} - T_Q}, \quad K_{\text{eq}} = \frac{\ln K_{\text{eq}} - T_{\text{eq}}}{v_{\max,\text{eq}} - T_{\text{eq}}}.$$

At equilibrium, $K_Q = K_{\text{eq}}$. When a stress is applied, T or v_{\max} changes, causing K_Q to deviate. The system reorganises (Phase 5) to a new equilibrium where K_Q again equals the new K_{eq} . The direction of shift is such that ϵ decreases – Le Chatelier’s principle is a tensional gradient descent.

15 Fritz Haber – Catalysis and the Haber Process

Haber developed the high-pressure catalytic synthesis of ammonia from nitrogen and hydrogen. In POLIS V12, a catalyst is a polis that temporarily forms a liquid mesh with the reactants, reducing the activation K threshold.

For the uncatalysed reaction, the activation energy E_a corresponds to a critical K_{crit} . The catalyst introduces an alternative path with a lower K_{crit} . The rate is

$$\text{rate} \propto \exp\left(-\frac{K_{\text{crit}}(2 + K_{\text{crit}})}{k_B T}\right).$$

The catalyst lowers K_{crit} from > 0.7 (Phase 4 threshold) to ≈ 0.5 (Phase 3). Thus the reaction can proceed at lower temperature and pressure. The catalyst itself remains unchanged because its own K values return to the original state after each cycle – a Phase 5 reorganisation that does not consume the catalyst.

16 Conclusion

Six additional chemical giants are reinterpreted within the POLIS V12 tensional ontology. Gas laws, the discovery of oxygen, the molecular hypothesis, benzene structure, equilibrium shifts, and catalysis all become natural consequences of the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$ and the fractal hierarchy of chemical polises. No free parameters are added; the same equations that describe a physical storm or a mathematical proof also describe the deepest structures of chemistry.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

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