

ORTHOGONAL-CONSTRAINT REVIEW RECORD

*The Chrysene Formalism as Candidate Mathematics
and Candidate Biogenesis: A Quantitative and
Categorical Survey of Volume 1, Number 1*

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REVIEW SCOPE AND OBJECTIVE

This article is the Volume 1, Number 2 editorial survey of the Volume 1, Number 1 corpus. It was evaluated under the journal's orthogonal-constraint architecture rather than under the Level 1 internal-consistency protocol used for the opening batch of Volume 1, Number 1 papers.

Three independent stages were run:

- (1) **Chemistry / domain stage.** Asks only whether molecular statements are chemically correct and appropriately hedged. Independent of mathematical-validity and concordance stages.
- (2) **Concordance stage.** Asks whether the survey remains concordant with the twelve-axiom formal core and with the patented 3,6,9,12 / 2,5,8,11 chrysene reference, or whether its account of the field has drifted. Independent of mathematical-validity and chemical-admissibility stages.
- (3) **Independent mathematical and logical audit.** Addresses definitions and domains; logical dependency; the proofs of Propositions 3 and 4 against the issue ledger; logical-status discipline; the deductive/empirical distinction; faithfulness of restated companion-paper material; internal consistency; and overreach.

Human editorial judgment is used to compile the three stages, to state a single publication disposition, and to keep the required repairs in one list. A more compact review-record format is planned for Volume 2; the present file is the Volume 1, Number 2 consolidation format.

Scope of Review

Orthogonal-constraint review at this tier evaluates chemical admissibility, concordance with the founding record, and internal mathematical-logical consistency of the survey's own claims. It does not constitute independent laboratory verification of patented compositions, and it does not re-prove companion theorems that the survey only cites. Readers evaluating a specific applied or geochemical claim are encouraged to consult a domain specialist in the relevant field. The three reports below are reproduced verbatim from the stage reviewers; the Condensed Revision Digest is an editorial compression of those reports' repair lists, not a substitute for them.

DISCLOSURE OF AI USE

The author claims the use of AI in the development and writing of the manuscript. The present record compiles human-commissioned orthogonal reviews of that manuscript. AI systems may have been used in the preparation or typesetting of individual review drafts; each stage report is signed as an independent constraint review and is reproduced as submitted.

ORTHOGONAL REVIEW PROCEDURE

This submission was evaluated under the journal's orthogonal-constraint protocol, consisting of three independent stages and one editorial compilation:

- (1) **Chemistry / domain review.** Molecular correctness and hedge strength only. *Record:* Chemistry Review, 11 September 2026. Rubric 81/100. Disposition: Admissible with Minor Revisions.

- (2) **Concordance review.** Faithfulness to A_1 – A_{12} , the patented reduct, and the patent/monograph record.

Record: Concordance Review, 11 September 2026. Rubric 73/100. Disposition: Concordant with Minor Revisions.

- (3) **Mathematical and logical audit.** Definitions, proofs of the survey’s own propositions, status discipline, and production defects.

Record: Independent Mathematical and Logical Review, 11 September 2026. Rubric 78/100. Disposition: Accept with Minor Revisions.

Review workflow: Three independent orthogonal-constraint reviews were commissioned and are reproduced verbatim below. The chemistry stage does not re-judge operator-algebraic proofs. The concordance stage does not re-prove the twelve-axiom core. The mathematical-logical audit does not independently re-prove companion theorems that are only cited. Findings are consolidated in the Editorial Board summary; required wording repairs are collected in the Condensed Revision Digest.

CONTENTS

Review Scope and Objective	1
Disclosure of AI Use	2
Orthogonal Review Procedure	2
Editorial Board & Review Committee Summary	5
Condensed Revision Digest	6
A. Framework versus patented composition	6
B. Thesis B and the portfolio map	6
C. Source caveats to restore	6
D. Review architecture and method claims	7
E. Production, citation, and abstract alignment	7
1. Chemistry Review (verbatim)	9
1.1. Remit and rule of interpretation	9
1.2. Issue register	9
1.3. Head-by-head answers	16
1.4. Disposition (chemistry)	16
1.5. Chemistry rubric	17
1.6. Minimal chemical repairs	17
2. Concordance Review (verbatim)	18
2.1. Governing question and sources	18
2.2. Concordance issue register	18
2.3. Head-by-head concordance	26
2.4. What is not a concordance failure	28
2.5. Disposition (concordance)	28
2.6. Concordance rubric	28
2.7. Minimal concordance repairs	28
3. Independent Mathematical and Logical Review (verbatim)	30
3.1. Mandate and scope	30
3.2. Mathematical-logical issue register	31

3.3. Audit against the eight required heads	36
3.4. What the paper gets right	40
3.5. Summary judgment (mathematical-logical)	40
3.6. Mathematical-logical rubric	41
3.7. Minimal revision list for the authors (mathematical-logical)	41
Final Remarks from the Editorial Review Committee Chair	43
Revision History	43
References	44

EDITORIAL BOARD & REVIEW COMMITTEE SUMMARY

Consolidated recommendation**Accept with Minor Revisions.**

The three stages agree on disposition class. No stage found a false locant set, a wrong point group for unsubstituted planar chrysene, an invalid original proposition, a deferred theorem sold as a theorem, or a hopane / geoporphyrin / meteoritic record treated as proof of Φ . The chemistry stage scores 81/100; the concordance stage 73/100; the mathematical-logical audit 78/100. Required repairs are wording, bibliographic, and completeness repairs. They do not reconstruct Thesis A or Thesis B.

The manuscript is an editorial survey of the Volume 1, Number 1 corpus. It restates, without reproof, a twelve-axiom formal core attributed to the companion paper, and it introduces its own objects (Definitions 2–5, Propositions 3–4, Remarks 1–2, Theses A–B) about a 38-paper ledger. The chemistry review finds the restated locant sets $\{2, 3, 5, 6, 8, 9, 11, 12\}$, the primary/dual split $\{3, 6, 9, 12\}$ versus $\{2, 5, 8, 11\}$, and the four-ring polyhex classification accurate for chrysene under standard IUPAC numbering. Unsubstituted planar chrysene is C_{2h} . No central chemical claim is false. The concordance review finds the deferred-theorem list and the axiom ladder to be faithful compressions of the source paper. Thesis A does not inject an unmotivated mathematical programme. Thesis B under-represents structure that the granted patents and later provisionals actually carry — in particular claimed nucleic-acid and phospholipid synthesis, photoreceptor and neuromorphic systems, and targeted-protein-degradation / metalloprotein design — but those gaps do not force a reconstruction of either thesis. The mathematical-logical audit finds Propositions 3 and 4 valid given the paper’s own data, and finds no centrally invalid deductive claim.

Recurring defects across the three stages are: a slight identification of the patented *substituted* composition with the bare carbon framework; dropped source caveats on $\mathcal{B}_4$, the locant frame, and $H_{\partial\pi}$; a thin operational statement of H ; under-representation of granted synthesis claims in Thesis B; citation and pagination collisions; a truncated sentence in Section 10; a false frequency claim in Appendix A.7; an incomplete technique census in Section 5; and modest overstatement in the abstract relative to what is proved in the body.

Stage	Disposition	Rubric	Date
Chemistry / domain	Admissible with Minor Revisions	81/100	11 Sep 2026
Concordance	Concordant with Minor Revisions	73/100	11 Sep 2026
Mathematical-logical audit	Accept with Minor Revisions	78/100	11 Sep 2026
Editorial compilation	Accept with Minor Revisions	—	11 Sep 2026

CONDENSED REVISION DIGEST

What must change before publication

The following list merges the three stage repair lists. Items are wording or bibliographic unless marked. No item requires rewriting Thesis A or substituting a different Thesis B.

A. Framework versus patented composition.

- (1) In Section 3.5, replace “literal, patented molecule” by a sentence that separates the unsubstituted chrysene carbon framework from the granted patents, which claim substituted compositions and systems on that framework. Do not call the formal witness $\mathfrak{R}^{\text{ex}}$ the patented molecule.
- (2) In Section 2, quote US 12,195,423 and US 12,473,247 by claimed subject matter (encoded design and integrated synthesis of nucleic acids and phospholipids, and related pharmaceutical products; systems of that composition).
- (3) In Section 2, mark the provisional list as claimed subject matter of filings, not experimental realisations.

B. Thesis B and the portfolio map.

- (4) In Section 7.2, attach nucleic-acid and phospholipid synthesis to Thesis B as the founding chemical content of the issued composition-of-matter claim. Treat hopane/sterane, kerogen, geoporphyrin, meteoritic chirality, and Abiotic Loom PDB checks as downstream empirical checks, not as that founding content.
- (5) Keep every causal verb (“explains,” “accounts for,” “produces”) out of Section 7.2. Leave the existing hedges.
- (6) Add a short portfolio-remainder paragraph naming photoreceptor/optical systems, neuromorphic/biomanufacturing lattices, and TPD/metallopeptide design, with provisional numbers. Soften “largely already present in the patent portfolio” to “the seven published fibres sit inside a larger filing map.”

C. Source caveats to restore.

- (7) Restore the $\mathcal{B}_4$ isolability / formula caveat: membership is graph-theoretic and does not imply an isolable neutral $\text{C}_{18}\text{H}_{12}$ hydrocarbon.
- (8) Add to Theorem 2 / Section 3.5: uniqueness is polyhex-congruence of the carbon framework; the standard locant frame is retained, not derived; $\text{Mod}(\mathcal{A})$ is not categorical.
- (9) Name $H_{\partial\pi}$ as the chemical realization hypothesis against which H in Definition 2 is evaluated.
- (10) In Section 4.2, give H three concrete tests: valency, locant substitution pattern, and isolability against the numbered chrysene reduct — not graph-isomorphism or narrative proximity.

- (11) Split “real spectral structure and spectral dimension” in the deferred list; record that $J_{\text{dc}}^2 = I$ is A_8 while the Dirac commutation sign is deferred.
- (12) In Section 7.1, name C_{2h} inequivalence, bipartiteness, and bay/K geometry as established molecular-reduct mathematics already inside A_1 – A_3 and Appendix A. Keep paper 34 as an extension of a deferred GF(4) target.

D. Review architecture and method claims.

- (13) Extend Section 4.5 so that submissions whose correctness depends on chemical or photophysical properties of the reference reduct (self-assembly, catalysis, molecular electronics, templated synthesis) receive the stronger tier — or define that tier by the predicate “evaluated against H .”
- (14) Label Section 8 as an Annals-method thesis, not as a consequence of US 12,195,423 or of monographs 1–12.
- (15) Once, in Section 4.2, state that F_{adm} is not Ω_{adm} and that a review exclusion is not a metric disconnection.
- (16) Parenthetical on Φ : a paper-17 hypothesis, not a target of source Section 11.

E. Production, citation, and abstract alignment.

- (17) Align the citation title with the article title. The surveyed object is Vol. 1 No. 1; the venue of publication is Vol. 1 No. 2.
- (18) Assign disjoint page ranges for this survey and the twelve-axiom companion. Cite the companion by its printed pages 405–476, or by article number, not by the colliding range 476–547.
- (19) Distinguish pre-monograph provisionals (items 1–32) from the volume-tracking block (33–47) and from item 48. Give the twelve-volume series its series title and ISBNs; do not let a single-volume bibliographic key stand for the series or for the provisional list.
- (20) Complete the truncated last sentence of Section 10.
- (21) Delete the duplicated “Figure 2 depicts this structure” paragraph in Section 4.3.
- (22) Correct Appendix A.7: H_∞ is not the single most frequent technique. Report actual rank (tied third) or “among the most frequent.”
- (23) Add discrete Morse theory to the residual technique list in Section 5, with count 2, and correct “eleven.”
- (24) Change “Section 4.3” to “Section 3.3” in Appendix A.2.
- (25) Weaken the abstract’s “logically independent” clause to match Proposition 4, or add the missing converse witnesses. Replace the unconstrained/constrained sentence by a clause that names the evidential base: a single retrospective case study, not yet extended to the corpus.
- (26) Define Basis (domain and codomain) before using it in Definition 4.
- (27) In Section 7.1, add one sentence: conditions (i) and (ii) of Thesis A are imported from the companion and are not re-established here.

Optional, not blocking

Demote Proposition 3 to a remark under Definition 2. Reserve the letter H for chemical admissibility; write $\text{Hyp}(\mathfrak{R})$ in Definition 1. Refer to restated axioms as A_1 and A_{12} , not as “Axiom 1” and “Axiom 2.” Define an occurrence count $n(\tau)$ instead of abusing T^{-1} . Add a one-paragraph notation block for $\text{Ext}_{12}(\mathfrak{C}^{\text{chr}})$, $\mathfrak{Q}_{\mathfrak{C}}$, and $\mathcal{B}_4$.

1. CHEMISTRY REVIEW (VERBATIM)

Chemistry / domain stage — independent of mathematical-validity and concordance stages

Title. The Chrysene Formalism as Candidate Mathematics and Candidate Biogenesis.

Author of record. Orthogonal-constraint review, chemistry / domain stage.

Venue. *Annals of the Chrysene Formalism*, ISSN 3144-2021.

Date. 11 September 2026.

Disposition. Admissible with Minor Revisions. Rubric total: 81/100.

Abstract of the chemistry review

This report asks only whether molecular statements in the editorial survey are chemically correct and appropriately hedged. The restated locant sets $\{2, 3, 5, 6, 8, 9, 11, 12\}$, the primary/dual split $\{3, 6, 9, 12\}$ versus $\{2, 5, 8, 11\}$, and the four-ring polyhex classification are accurate for chrysene under standard IUPAC numbering. Unsubstituted planar chrysene is C_{2h} . The survey keeps the non-vacuity model labelled as a formal witness and keeps Thesis B's geochemical citations at proposal strength. No central chemical claim is false. Remaining defects are: a slight identification of the patented *substituted* composition with the bare carbon framework; a missing vertex-count caveat on $\mathcal{B}_4$; a thin operational statement of H ; and one sentence in Theorem 2 that can be read as if the explicit model were the patented substance. Disposition:

Admissible with Minor Revisions. Rubric total: **81/100**.

1.1. Remit and rule of interpretation. This stage does not re-judge operator-algebraic proofs or concordance with A_1 – A_{12} . It asks whether sentences that carry molecular meaning are chemically right, and whether hedging matches the evidence.

Two halves of the standing rule:

- An explicit twelve-axiom model need not be a flask compound, if it is labelled as a formal witness.
- Chemically familiar intuition (PAH stacking, hydrophobicity, 18π porphyrins, biomarker ratios) must not convert an undischarged realization hypothesis into a settled mechanism.

The manuscript is a survey. It is judged on the restatement of Axiom A_1 / Theorem 2 and on how it reports corpus chemistry, not on whether it re-derives that chemistry.

1.2. Issue register.

Issue 1. “Literal, patented molecule” identifies a graph with a substituted composition

Location: Section 3.5, last sentence of the Theorem 2 commentary; Section 2 opening.

Classification: Blurred existence-witness distinction / overstated plausibility.

Severity: Minor.

Theorem 2 is correctly cited as a formal existence result (source Theorem 61 plus Appendix A). The commentary then says the model’s canonical carbon framework “coincides with the literal, patented molecule of Section 2.”

That sentence puts two different chemical objects in one phrase:

- the carbon-skeleton graph of unsubstituted chrysene, $C_{18}H_{12}$, which is what the seven-polyhex enumeration identifies;
- US 12,195,423 / US 12,473,247, whose claimed subject is encoded design and integrated synthesis of nucleic acids, phospholipids, and related pharmaceutical products — i.e. a *substituted* chrysene composition and systems built on it.

The skeleton of the patented compounds is chrysene. The patented substance is not the bare graph, and it is not the formal witness $\mathfrak{R}^{\text{ex}}$ of Appendix B (a labelled embedded node plus algebraic data). The standing rule is violated only in wording: the witness is still called a model, but “literal, patented molecule” lets a reader treat $\mathfrak{R}^{\text{ex}}$ as if it were the issued composition of matter.

Recommended revision: Write: the canonical carbon-framework reduct is polyhex-congruent to unsubstituted chrysene; the granted patents claim substituted compositions and systems on that framework. Do not call the formal witness the patented molecule.

Issue 2. $\mathcal{B}_4$ is stated without the source’s vertex-count caveat

Location: Section 3.2, Axiom 1 restatement; source Remark 3.

Classification: Terminological imprecision.

Severity: Editorial.

“Four-ring polyhex comparison class $\mathcal{B}_4$ ” is the right combinatorial domain. Chemically it is not a list of isolable $C_{18}H_{12}$ hydrocarbons. The seven free tetrahexes include peri-fused skeletons with other formulae (pyrene is $C_{16}H_{10}$). Source Remark 3 says this. The survey drops it. A chemist reading only the survey can think Axiom 1 restricts attention to chrysene’s isomers of formula $C_{18}H_{12}$.

The restatement does not thereby mis-number chrysene. It under-specifies the comparison class.

Recommended revision: Restore one clause from source Remark 3: membership in $\mathcal{B}_4$ is graph-theoretic and does not imply an isolable neutral $C_{18}H_{12}$ hydrocarbon.

Issue 3. C_{2h} is correct for the parent and is not over-claimed for inequivalent substitution

Location: Theorem 2 (point-group types); implicit via the source axioms the survey cites.

Classification: None as an error; recorded so the symmetry head is not left unchecked.

Severity: —

Unsubstituted planar chrysene is C_{2h} (inversion centre at the midpoint of the 4b–10b bond, σ_h = molecular plane). That is standard and is the point-group type the seven-polyhex table is being asked to match.

Under C_{2h} , peripheral carbons of planar chrysene fall in inversion pairs

$$\{1, 7\}, \{2, 8\}, \{3, 9\}, \{4, 10\}, \{5, 11\}, \{6, 12\}.$$

The primary set $\{3, 6, 9, 12\}$ is therefore *two* pairs, not one orbit: $\{3, 9\}$ versus $\{6, 12\}$. Those two pairs are chemically different environments (terminal-ring β -type CH versus a distinct inner-perimeter CH). That is exactly why a later inequivalence axiom is chemically well-posed. Identical tetra-substitution at 3, 6, 9, 12 preserves C_{2h} . Different linker chemistry on the 3, 9 pair versus the 6, 12 pair reduces the point group (typically to C_i if inversion is kept).

The survey does not say that a 3,6,9,12-heterosubstituted node remains C_{2h} . It should not start saying that. No revision required on this head beyond not tightening the wording in revision.

Issue 4. Locants and the one-step dual cipher are chemically accurate

Location: Section 3.2, Axiom 1.

Classification: None as an error.

Severity: —

IUPAC chrysene numbering assigns twelve peripheral CH locants 1–12. The eight numbers used in Axiom 1 are real locants. Adjacent pairs

$$3 \sim 2, 6 \sim 5, 9 \sim 8, 12 \sim 11$$

are one-step walks on the perimeter. Calling $\{3, 6, 9, 12\}$ primary and $\{2, 5, 8, 11\}$ dual is a convention, not a chemical error. The survey correctly refuses to let Axiom 1 name the graph “chrysene” by fiat. Relative to the source axiom, the restatement does not add a wrong bond, a wrong locant, or a peri-fused fifth ring.

Issue 5. Provenance chemistry is accurate as a filing list, not as demonstrated chemistry

Location: Section 2.

Classification: Overstated plausibility (mild), if read as accomplished chemistry.

Severity: Editorial.

The two grants exist and are composition-of-matter plus systems. The forty-eight provisionals do extend toward therapeutic modulation, targeted protein degradation, quantum architectures, neuromorphic and biomanufacturing systems, finance, and cryptography. That is an accurate description of *what was filed*.

What Section 2 must not be taken to say, and mostly does not say: that a chrysene core has been shown to degrade a target protein, to template a nucleic acid in water, or to function as an ambient-temperature coherent device. Those are claimed directions. Targeted protein degradation in particular requires a demonstrated recruitment mode (typically an E3-ligase binder). A PAH scaffold patent is not that demonstration.

Section 2 is written as lineage, not as a results paragraph. The risk is only the reader who treats the filing list as a capability list.

Recommended revision: Add one sentence: the list records claimed subject matter of filings, not experimental realisations.

Issue 6. Thesis B's empirical anchors are real records; the survey does not promote them to mechanisms

Location: Section 7.2.

Classification: Overstated plausibility, only if the “consistent with” sentence is read as support for Φ .

Severity: Minor as written; not a chemical falsehood.

Check by item.

Hopane / sterane and redox catalysts (papers 18, 22). Hopane and sterane hydrocarbons are genuine Precambrian–Phanerozoic biomarkers; hopane/sterane ratios and 2- versus 3-methylhopane indices are used in that literature. Dual-chrysene “catalyst families” as the cause of the Precambrian asymmetry is a proposal, not a geochemical result. The survey says “against the Precambrian biomarker record” and “proposes.” That is the right strength. It does not invent a hopane that the record lacks.

Kerogen (paper 19). Kerogen does contain fused aromatic networks and metal-binding sites. Thermal maturity (R_o , $T_{\max}$) alters and eventually erases those signatures. An explicit maturity bound is the chemically correct qualifier. The survey reports the bound. It does not say shale kerogen *is* a chrysene lattice.

Geoporphyrins (paper 20). Intact nickel and vanadyl geoporphyrins from ~ 1.1 Ga Taoudeni Basin shales are a published fact (Gueneli et al., *PNAS* 2018): Ni and VO etio and DPEP homologues concentrated in a C_{29} – C_{32} window, with higher homologues present. “1.1 Ga geoporphyrin carbon-number window” is

therefore a well-posed description of an existing record. The dual-chrysene cage rearrangement that is supposed to produce an 18π macrocycle is not implied by that record. The survey calls it a proposal “against” the window. Atom economy from two chrysene C_{18} units to a porphyrin core is not discussed here and does not need to be, because the survey does not assert the rearrangement as a reaction that has been run.

Homochirality (paper 21). Meteoritic α -amino acids show compound-dependent L -enantiomeric excesses; they are not a universal absolute L -world. The survey’s “statistical (not absolute) L -amino-acid excess consistent with meteoritic data” is the chemically correct hedge. A persistent chiral step-defect of a chrysene lattice as the *cause* remains a realization hypothesis. The survey does not close Φ with this paragraph.

Abiotic Loom versus PDB (papers 24, 25). Public PDB Ramachandran densities are a real corpus. Reporting helix and strand enrichment and $\sim 72\%$ residue coverage, as numbers the papers computed against structures they did not hand-pick after the fact, is a legitimate empirical-check description. Backbone dihedral windows are not a chemical demonstration that proteins fold on a chrysene lattice. The survey treats them as a check, and Section 9.2 still holds Φ unproved. That is the right relationship.

The one sentence that can be pushed too far is the summary that the geometry “is consistent with, and in the cases above motivates specific checks against, an existing biogenesis record.” Consistency with a record is cheap. It is not chemical support for a mechanism. The surrounding paragraphs already say Φ is unproved and that no wet synthesis under the proposed conditions is reported. Leave that frame; do not strengthen “consistent with.”

Recommended revision: Keep the hedges. Do not add causal verbs (“explains,” “accounts for,” “produces”) in revision.

Issue 7. Cluster blurbs for papers 9, 28, and 36–38 are chemically in scope

Location: Section 6.

Classification: None as an inaccuracy; one scope reminder.

Severity: Editorial.

Paper 28. Chrysene is a poorly water-soluble PAH (aqueous solubility negligible; $\log P$ high). A hydrophobicity / desolvation / PEG-functionalization argument for a passive geometric “splint” is chemically ordinary language. The survey does not quote a measured K_d or a crystal structure of a chrysene–protein complex. Two-round review narrowed the claim from active control to passive confinement; the survey records that narrowing. Appropriate.

Papers 36–38. The named external benchmark is a dibenzo[g,p]chrysene kagome sp^2 -carbon COF used for Pt-assisted photocatalytic hydrogen evolution (Yu et al., *Adv. Mater.* 2025). That paper is a real experimental COF, not

the reference reduct. Dibenzo[*g,p*]chrysene is not chrysene: it is a different, typically non-planar, PAH. The survey keeps the names apart (“rectangular chrysene network” versus “dibenzochrysene Kagome benchmark”) and reports the comparison as conditional, with an explicit limit-of-quantification bound and cautions on transition-metal non-radiative loss and on Bloch velocity versus macroscopic mobility. Those cautions are the chemically right ones. Do not let later sentences collapse the benchmark into “chrysene.”

Paper 9. Ambient-temperature coherence in a small organic molecular device is not a chemically routine claim. The survey records an independent feasibility assessment that flagged major open physical obstacles. That is the minimum acceptable hedge. It should stay.

Issue 8. *H* is pointed at the right object and is operationally thin

Location: Section 4.2, Definition 2; Section 2.

Classification: Terminological imprecision (criteria unspecified), not a conflation.

Severity: Minor.

H is defined as the subset of assertions whose molecular interpretation is chemically admissible against the reference structure of Section 3. Proposition 3 keeps *H* orthogonal to *M* and *C*. The survey does not treat internal coherence as chemical admissibility. That half is clean.

What *H* does *not* say is what a chemist would actually check: elemental composition and valency, isolability versus a purely combinatorial polyhex, steric clash at the stated locants, whether a proposed linker is a real functional group, whether a reaction is a documented transformation or a formal contraction, whether a claim is about unsubstituted chrysene or about a 3,6,9,12-substituted derivative. Without those tests, “chemically admissible against the reference structure” can be read as “uses chrysene vocabulary.”

For a survey that does not itself apply *H* to the thirty-eight papers, a thin definition is tolerable. It becomes a problem the first time *H* is used as a pass/fail on a molecular paper.

Recommended revision: Add a parenthetical: *H* evaluates valency, substitution pattern, and isolability against the numbered chrysene reduct, not graph-isomorphism or narrative proximity.

Issue 9. The absence-of-synthesis statement is specific and, on the published corpus, fair

Location: Section 9.2; Section 7.2 last paragraph.

Classification: None as an inaccuracy.

Severity: —

The sentence is:

no paper in the corpus reports a wet-laboratory synthesis of the patent chemistry of Section 2 under the reaction conditions the biological papers propose.

Three restrictions make it checkable:

- (1) *Paper in the corpus*, not “anywhere in chemistry”;
- (2) *patent chemistry of Section 2*, not “any substituted chrysene ever made”;
- (3) *under the conditions the biological papers propose*, not “under any conditions.”

Unsubstituted chrysene is a commercial coal-tar hydrocarbon. Many substituted chrysenes appear in the general synthetic literature. Granted composition-of-matter patents commonly contain working or prophetic examples of the core. None of that contradicts the sentence as written. The sentence would be false only if a Volume 1, Number 1 paper reported a wet synthesis of the patented encoding chemistry in the prebiotic or physiological regime those biological papers describe. This review is not aware of such a report in the corpus, and the survey’s own ledger does not list one.

Do not broaden the sentence to “chrysene has never been synthesized.” Do not narrow it to “no chrysene chemistry exists in the patents.” Leave the three restrictions.

Issue 10. Nomenclature

Location: Throughout.

Classification: Terminological imprecision, local only.

Severity: Editorial.

Used in a standard way: chrysene, benzenoid, locant, point group, conjugated π -framework (in the source; barely in the survey), hydrophobicity, desolvation, geoporphyrin, kerogen, hopane, sterane, homochirality, Ramachandran.

Used in a graph-theoretic way that chemists also accept: bipartite (benzenoid skeletons are bipartite).

Not used in the survey body, and therefore not abused here: bay-region, K-region. Those terms are in the source appendix with a nomenclature correction. The survey is silent; silence is safer than a wrong bay-region label.

“Polyhex” is combinatorial English, not IUPAC. Acceptable in a class definition if Issue 2’s caveat is restored.

“Dual cipher” is formalism jargon, not a chemical term. It is not passed off as IUPAC.

Issue 11. Overreach inventory

Sentences that stay on the right side of the standing rule:

- Theses stated as candidates with unproved premises (Section 7 opening).

- Φ unproved; no wet synthesis under the proposed biological conditions (Section 9.2).
- $d_C^* = +\infty$ not licensed as physical scission (Section 3.4).
- Papers 36–38 conditional; paper 9 obstacles flagged; paper 17 bifurcated into protocol-verifiable versus extrapolated claims.

Sentence that sits on the line:

- Section 3.5, “coincides with the literal, patented molecule” (Issue 1).

No sentence in the survey asserts a measured rate, a crystal structure of a chrysene–biopolymer adduct, a prebiotic yield, or an ambient-temperature coherence time. The chemistry narrative is not more experimentally grounded than the corpus. It is slightly more ontologically compact than the patent record (graph = patented substance), which Issue 1 already flags.

1.3. Head-by-head answers.

1.3.1. *Restated molecular reduct.* Chemically accurate. Locants exist; primary and dual sets are complementary perimeter subsets related by one-step displacement; $\mathcal{B}_4$ is the right class with the vertex-count caveat restored (Issue 2). No inaccuracy relative to source Axiom A_1 beyond that dropped remark.

1.3.2. *Point group.* C_{2h} is correct for unsubstituted planar chrysene. The survey does not assign C_{2h} to a heterosubstituted 3,6,9,12 node. Good.

1.3.3. *Existence witness versus flask compound.* Mostly held. One blurring sentence (Issue 1). Appendix-style construction is not represented as a recorded synthesis.

1.3.4. *Provenance chemistry.* Accurate as a description of filings. Must not be read as a demonstration list (Issue 5).

1.3.5. *Thesis B calibration.* Records cited are real. Hedges are the right strength. Do not promote “consistent with” to a mechanism (Issue 6).

1.3.6. *Cluster chemistry.* Papers 9, 28, 36–38 are described inside their chemical scope. Dibenzo[g,p]chrysene is kept distinct from chrysene.

1.3.7. *Criterion H.* Not conflated with M or C . Operationally thin (Issue 8).

1.3.8. *Absence of synthesis.* Specific enough to check. Fair on the published corpus (Issue 9).

1.3.9. *Nomenclature.* Standard, with “polyhex” as combinatorial language.

1.3.10. *Overreach.* No settled-mechanism sentence. One graph-versus-composition compression.

1.4. Disposition (chemistry).

Admissible with Minor Revisions

“Requires Chemical Reconstruction” would be used if the locants were wrong, if C_{2h} were assigned to the wrong substitution pattern, if $\mathfrak{R}^{\text{ex}}$ were presented as a synthesized pharmaceutical, or if hopane/sterane, 1.1 Ga porphyrins, or meteoritic L -excesses were treated as proof of Φ . None of those occurred. Required repairs are wording: separate the carbon framework from the patented composition; restore the $\mathcal{B}_4$ caveat; say what H checks; keep every causal verb out of Section 7.2.

1.5. Chemistry rubric.

#	Category	Score	Note
1	Molecular reduct (locants, connectivity, class)	9	Locants and sets right; $\mathcal{B}_4$ caveat dropped
2	Point-group / symmetry claims	9	Parent C_{2h} right; substitution reduction not o
3	Witness vs. synthesizable molecule	8	One blurring sentence at Theorem 1
4	Provenance patent chemistry	8	Filings described correctly; capability-lis
5	Thesis B plausibility calibration	8	Records real; “consistent with” must stay
6	Cluster chemistry blurbs	9	Papers 9, 28, 36–38 in scope; $\text{DBC} \neq \text{ch}$
7	Criterion H	7	Orthogonal to M, C ; tests unspecific
8	Absence-of-synthesis statement	9	Three restrictions make it checkable
9	Nomenclature	8	Standard; polyhex is combinatorial
10	Absence of chemical overreach	8	No false experiment; graph/patent compres
Total		81	

1.6. Minimal chemical repairs.

- (1) In Section 3.5, replace “literal, patented molecule” by “unsubstituted chrysene carbon framework; the granted patents claim substituted compositions on that framework.”
- (2) Restore the $\mathcal{B}_4$ isolability / formula caveat.
- (3) In Section 2, mark the provisional list as claimed subject matter, not demonstrated chemistry.
- (4) In Section 4.2, give H three concrete tests: valency, locant substitution pattern, isolability.
- (5) Leave Section 7.2’s hedges as they are; do not add mechanistic verbs.

2. CONCORDANCE REVIEW (VERBATIM)

Concordance stage — independent of mathematical-validity and chemical-admissibility stages

Title. The Chrysene Formalism as Candidate Mathematics and Candidate Biogenesis.

Author of record. Orthogonal-constraint review, concordance stage.

Venue. *Annals of the Chrysene Formalism*, ISSN 3144-2021.

Date. 11 September 2026.

Disposition. Concordant with Minor Revisions. Rubric total: 73/100.

Abstract of the concordance review

This report asks one question: does the Volume 1, Number 2 editorial survey remain concordant with the twelve-axiom formal core and with the patented 3,6,9,12 / 2,5,8,11 chrysene reference, or has its account of the field drifted? The deferred-theorem list and the axiom ladder are faithful compressions of the source paper. Thesis A does not inject an unmotivated mathematical programme. Thesis B, the seven-category taxonomy, and the provenance section under-represent structure that the granted patents and the later provisional/monograph record actually carry — in particular the claimed nucleic-acid and phospholipid synthesis, photoreceptor and neuromorphic systems, and targeted-protein-degradation / metalloprotein design. None of those gaps forces a reconstruction of Thesis A or Thesis B. Disposition: **Concordant with Minor Revisions**. Rubric total: **73/100**.

2.1. Governing question and sources. Concordance is not internal coherence and is not proof correctness. A manuscript fails concordance when it

- drops structure that the axioms, the molecule, or the patent/monograph record already support, or
- inserts a domain or implication that those sources do not warrant.

Sources used here: the survey under review; the twelve-axiom paper (Axioms A_1 – A_{12} , Theorems 8, 36, 55, 61, Section 11 deferred programme, Appendix A–B); the DOE bibliography (US 12,195,423; US 12,473,247; forty-eight provisionals 63/905,569 through 64/118,496; twelve monograph ISBNs).

No item below is marked concordant by default.

2.2. Concordance issue register.

Issue 1. Granted composition-of-matter subject is not named where Thesis B is stated

Location: Section 7.2 (Thesis B); also Section 2, first paragraph.

Classification: Omission of supported structure.

Severity: Minor (borderline major for provenance; not a reconstruction of the thesis).

The two granted patents are

US 12,195,423, composition of matter: *Encoded design integrated synthesis of nucleic acids, and phospholipids, and related pharmaceutical products*;

and the divisional US 12,473,247 on systems of that composition. Those claims are the legal description of the founding molecule's intended chemical work: templated nucleic-acid and phospholipid synthesis, and pharmaceutical products of that encoding.

Section 7.2 states Thesis B as a candidate mechanism of biogenesis, homochirality, and macro-evolutionary stability, and then lists hopane/sterane, kerogen, geoporphyrin, meteoritic chirality, and Abiotic Loom PDB checks. It never names nucleic acids or phospholipids. Section 2 calls the grants "a composition-of-matter patent and a divisional patent on its associated systems" and does not quote the claimed subject matter.

The omission does not make Thesis B unsupported — provisionals 63/914,395 through 63/923,654 (protocells), 63/985,933 (constrained origination of genetic information / reverse translation), and 64/091,432–64/098,432 (origination of the biosphere) do support a biogenesis programme. It does misalign the thesis with the one document that actually fixes *H*: the issued composition-of-matter claim. A reader of Section 7.2 would think the chemical core of Thesis B is a paleobiomarker argument. The issued claim is an encoded-synthesis argument.

Recommended revision: In Section 2, quote the granted titles. In Section 7.2, state that the composition-of-matter claim already names nucleic-acid and phospholipid synthesis, and treat the biomarker and Abiotic Loom papers as downstream checks, not as the founding chemical content of Thesis B.

Issue 2. Thesis B under-represents the biological applications the portfolio actually filed

Location: Section 7.2; Table 1, Medical & Pharmacological Networks versus Cosmological & Biological Emergence.

Classification: Omission of supported structure.

Severity: Minor.

The provisional record is not primarily a paleontology portfolio. Biologically load-bearing filings include:

- 64/118,496 — multivalent target modulation, targeted protein degradation, allosteric activation;
- 64/013,688 and 64/006,549 — 3,6,9,12-substituted chrysene therapeutics;
- 64/105,781 — catalytic clefts and metallopeptide matrices;
- 64/104,134 — Abiotic Loom polypeptide topologies;

- 63/973,267 — heme and chlorophyll from a common tetrasubstituted chrysene scaffold;
- 63/965,531 and 63/967,515 — twisted-on-slipped photoreceptors and a templated visual-cortex pathway;
- 63/948,754 — synthetic G6PD and BER enzyme design;
- 63/978,060 — solid-state ribosome architecture.

Section 7.2 does not treat therapeutics, templated enzyme construction, or photoreceptor geometry as part of the biological thesis. Table 1 puts most of the medical corpus under H_∞ clinical-governance arguments that the survey itself classifies as Basis = Math. Paper 28 is the sole molecular medical item named.

The result is a split that the portfolio does not enforce: “biology” = origin-of-life narrative; “medicine” = abstract control theory. The molecule’s actual claimed biological work sits between those labels and is thinner in the survey than in the filing record.

Recommended revision: Either widen Thesis B’s evidential base to include the granted synthesis claim and the therapeutic / templating provisionals, or state explicitly that Thesis B is only the origination sub-programme and that the patent biology lives in a separate, still molecular, applied cluster.

Issue 3. Seven-category taxonomy drops domains the monographs and provisionals treat as first-class

Location: Table 1; Section 6 survey of fibres; Section 2 claim that the categories are “largely already present in the patent portfolio.”

Classification: Omission of supported structure.

Severity: Minor.

The seven editorial categories match the twelve-volume series at coarse grain (foundations, tensorial framework, cosmology, biosphere, medicine, containment, quantum, cryptography, finance). Three portfolio domains have no fibre and no proportionate discussion:

- (1) **Optical / photoreceptor systems.** Provisionals 63/965,531, 63/967,515, 63/971,555; monograph volume 4–5 adjacency. Absent from Table 1. Paper 20 (photosynthetic macrocycle) is the nearest published proxy and is filed under Cosmological & Biological Emergence, which hides the device-level optical programme.
- (2) **Neuromorphic transduction and biomanufacturing lattices.** Provisionals 63/987,679, 64/001,177, 63/988,106. Not a category. Not represented by the two-paper Quantum Architectures fibre (papers 9 and 15), which is molecular quantum logic, not neuromorphic fabrication.

(3) Targeted degradation / metallopeptide / catalytic-cleft design.

Provisionals 64/118,496, 64/105,781, 63/973,267. Collapsed into a Medical fibre whose survey text is five H_∞ governance papers plus one molecular splint.

Section 2's sentence that the Table 1 categories "are not a taxonomy invented for the journal, but largely already present in the patent portfolio" is true of the seven labels and false as a completeness claim. "Largely" is doing too much work.

No Table 1 category lacks portfolio grounding. Finance (monograph 12, 64/111,029) and Cryptography & AGI Containment (monographs 8 and 11, 64/110,131, 64/106,983) are in the record. They are not injections relative to the portfolio. They are weakly grounded in the carbon framework itself; that is a different defect and is not scored as injection against the founding *record*.

Recommended revision: Keep the seven categories. Add a short "portfolio domains not yet a published fibre" paragraph naming photoreceptor/optical systems, neuromorphic/biomanufacturing lattices, and TPD/metallopeptide design, with provisional numbers. Soften "largely already present" to "the seven published fibres sit inside a larger filing map."

Issue 4. Review-tier allocation omits the chemical-materials class for which H is most load-bearing

Location: Section 4.5.

Classification: Omission of supported structure.

Severity: Minor.

Section 4.5 requires orthogonal-constraint review for (i) framework revisions, (ii) computational or hardware assemblies whose correctness depends on the sequence algebra or the spectral triple, and (iii) clinical or healthcare-directed claims. Those three classes are warranted:

- (i) is A_1 – A_{12} itself;
- (ii) is A_7 and A_9 , which are the load-bearing operator structures;
- (iii) is the granted pharmaceutical claim and provisionals 64/100,634–64/101,655, 64/013,688.

What the allocation misses is the class for which chemical admissibility H is most directly a check against the patented reduct: applied topological engineering and molecular-device papers that assert self-assembly, photocatalysis, or ambient-temperature coherence of the actual 3,6,9,12-connected network (Volume 1, Number 1 papers 16 and 36–38; paper 9). Those papers are not healthcare and need not invoke A_7 or A_9 . Under Section 4.5 they remain on Level 1. That is the wrong tier if H is the exogenous criterion Section 2 says it is.

A category that does *not* need the stronger tier on molecular grounds is Financial Networks. Section 4.5 already leaves it on Level 1. That choice is consistent with the molecule.

Recommended revision: Add a fourth designated class: submissions whose correctness depends on chemical or photophysical properties of the reference reduct (self-assembly, catalysis, molecular electronics, templated synthesis). Alternatively, define the stronger tier by predicate — any claim that is evaluated against H — rather than by venue-like labels “healthcare” and “hardware.”

Issue 5. Provenance compresses the twelve-volume map and mis-cites the companion’s pages

Location: Section 2; reference [2], [3], [4].

Classification: Faithful restatement error / omission.

Severity: Minor.

Accurate in Section 2:

- two granted patents, numbers as in the DOE list;
- forty-eight provisionals, October 2025–July 2026 (DOE item 1 is 63/905,569, 26 Oct 2025; item 48 is 64/118,496, 24 Jul 2026);
- a twelve-volume series under the series title used in the DOE heading.

Incomplete or inaccurate:

- The granted titles’ subject matter is not stated (Issue 1).
- “Each filing corresponding to specific volumes” holds for provisionals 64/086,222 through 64/111,029 (DOE 33–47), several of which are split parts of volumes 5–7. It does not hold for items 1–32, which predate the monograph-tracking block, or for item 48, which is outside the twelve-volume map. Section 2 reads as if the forty-eight filings are the twelve-volume programme.
- In-text [2] is the series *The Mathematical Structure of Reality*; the survey’s own bibliography entry [2] is only volume 1’s title and ISBN 979-8-950371-08-0. Volume 2 is 979-8-950371-03-5, which the survey cites as [3] while using that key for “forty-eight provisional patent applications.”
- The survey cites the twelve-axiom paper as 1(2):476–547. The source document supplied for this review is paginated 405–476. The survey itself is paginated 476–488. The companion page range in Section 2 is not the companion’s printed range.

Recommended revision: Cite granted titles in full. Distinguish the 1–32 pre-monograph provisionals from the 33–47 volume-tracking block and from 48. Give [2] as a series with twelve ISBNs. Cite the twelve-axiom paper by its printed pages, 405–476, or by article number, not by a colliding range.

Issue 6. Section 3 omits two source caveats that change the meaning of “identified with chrysene”

Location: Section 3.5, Theorem 2; compare source abstract and Remarks 42 and 44.

Classification: Faithful restatement error.

Severity: Minor.

What Section 3 gets right:

- ladder A_1 – A_3 molecular, A_4 – A_6 tensorial / $\mathbb{Z}^3$, A_7 – A_8 sequence algebra and dual-cipher commutant, A_9 spectral triple, A_{10} – A_{12} Hamiltonian / response / admissibility — this is the source’s Section 8.18 hierarchy;
- Theorem 1 of the survey is source Theorem 8;
- Theorem 2 of the survey is source Theorem 61 plus the Appendix A enumeration (source Theorems 51 and 55);
- the three displayed non-implications match the source introduction;
- the deferred list in Definition 1 / Section 7.1 matches source Section 11 at the level of named targets.

What Section 3 silently drops:

- The source abstract and Remark 42: the standard $3, 6, 9, 12 \leftrightarrow 2, 5, 8, 11$ locant frame “is retained on the reference and standard-locant realization class rather than derived uniquely from the axioms.” Survey Theorem 2 says $\mathfrak{C}^{\text{chr}}$ “is independently identified . . . with the standard graph of chrysene,” which a reader can take as uniqueness of the numbered locant frame. The source denies that uniqueness.
- Source Definition 4, the Conjugated π -Framework Hypothesis $H_{\partial\pi}(\mathfrak{R})$, is the chemically qualified successor of the old perimeter-conductivity condition and is explicitly not an axiom. The survey’s logical hierarchy in Section 3.1 does not mention it. Without it, “chemical admissibility H ” in Definition 2 has no named chemical content inherited from the source.
- Source Theorem 36 / Corollary 6: uniqueness is of the canonical carbon framework up to polyhex congruence; the full twelve-axiom theory is not categorical. Survey Theorem 2 states non-vacuity and identification; it does not restate non-categoricity of $\text{Mod}(\mathcal{A})$.

These are compressions that change scope, not mere omissions of detail. The locant-frame caveat is the difference between “the axioms force chrysene numbering” and “the axioms force the chrysene carbon skeleton, and the numbering is a reference convention.”

Recommended revision: Add two sentences to Theorem 2 / Section 3.5: uniqueness is polyhex-congruence of the carbon framework; the standard locant frame is retained, not derived. Name $H_{\partial\pi}$ as the chemical realization hypothesis against which H in Definition 2 is evaluated.

Issue 7. Deferred-programme compression merges distinct source targets

Location: Section 3.6 and Section 7.1; source Section 11, Theorems 40–49.

Classification: Faithful restatement error.

Severity: Editorial.

The survey lists: $N_y = N_x + 2$; GF(4) multiplication; directional transfer and optical anisotropy; spectral–path reconstruction; real spectral structure and spectral dimension; higher-algebraic braiding; emergent chirality; dynamical scission.

The source treats as separate targets: $N + 2$ (Thm. 40); GF(4) (Thm. 41); directional transfer (11.3); optical / dielectric anisotropy (11.4, with an extra bulk-limit warning); spectral–path compatibility, in three strengths (Thm. 44); J_{dc} as a real structure / KO -dimension (11.6); spectral dimension (Thm. 46); emergent assembly chirality (Thm. 47); noncocommutative coproduct / R -matrix (Thm. 48); dynamical scission (Thm. 49).

Merging transfer with optics, and real structure with spectral dimension, does not add a false target. It does hide that $J_{dc}^2 = I$ is already axiomatic in A_8 while $J_{dc}D\mathfrak{e} = \varepsilon'D\mathfrak{e}J_{dc}$ is not. A reader of the survey can think “real spectral structure” is entirely open. In the source, half of it is A_8 .

Recommended revision: Keep the survey list, but split “real spectral structure and spectral dimension” into two bullets and note that $J_{dc}^2 = I$ is A_8 while the Dirac commutation sign is deferred.

Issue 8. Thesis A omits molecule-native mathematics that the source treats as structural

Location: Section 7.1; source Axioms A_2 , A_3 , A_8 , Appendix A.9.

Classification: Omission of supported structure.

Severity: Editorial to minor.

Thesis A’s evidence is: non-vacuity (Theorem 2 / source Theorem 61); an established core (survey Theorem 1 / source Theorem 8, and the companion’s proved lemmas); the deferred list; papers 13 and 34 as active pursuit.

Molecule-native structure that Section 7.1 does not use as part of the “candidate field” portrait:

- C_{2h} stabilizer and the $O(3)$ -conjugacy relation of A_2 — the reason the comparison class is not an arbitrary polyhex;
- directional inequivalence of the two primary attachments under the carbon-framework stabilizer (A_3) — the geometric reason a $N_y = N_x + 2$ theorem is even well-posed;
- balanced bipartiteness of the chrysene skeleton (source p. 5 / concordance table), which earlier papers called the C_{2h} bipartite isomorphism and which is *not* a deferred theorem;

- bay- and K-region perimeter geometry (source Appendix A.9), restored in the twelve-axiom concordance table and unused in the survey’s pure-mathematics account.

None of this is contradicted. It is left out of the picture of what the field is. Paper 34’s Geometric Langlands correspondence for $\text{GF}(4)$ representations is the opposite movement: it is in the survey as evidence of an open frontier, while the source still treats a structurally induced $\text{GF}(4)$ multiplication as unproved. The survey does not call paper 34 a theorem of A_1 – A_{12} . That is acceptable, but it should not be the only exhibit of “active pursuit” when A_2 , A_3 , and the bay/K geometry are the molecule’s own mathematics.

Recommended revision: In Section 7.1, name C_{2h} inequivalence, bipartiteness, and bay/K geometry as established molecular-reduct mathematics already inside A_1 – A_3 and Appendix A. Keep paper 34 as an extension of a deferred target, not as the representative of the field.

Issue 9. “AI as constrained collaborator” is a journal-method claim, not a founding-record claim

Location: Section 8; Remark 2; Abstract.

Classification: Injection of unsupported structure (methodological, not scientific).

Severity: Minor.

The granted patents and the twelve monographs describe the molecule as a composition of matter, a lattice, and a source of discrete noncommutative geometry. They do not describe a review architecture, an exogenous constraint on generative models, or a collaborator/unconstrained contrast.

Section 8’s argument — admission of a new assertion is never a function of generative coherence alone, because H is fixed by Axiom A_1 and the patent — is a legitimate reading of how the *journal* chose to use the molecule. It is not a claim the founding chemical and mathematical documents make. The abstract states it as a finding of the survey. That promotes a methodological overlay into the field’s self-description.

The framing does not rewrite A_1 – A_{12} and does not add a fake applied domain. It does change what a reader thinks the Annals is for: a test of constrained generation, rather than a vehicle for the patented reduct and its deferred theorems. The journal may be both. Only one of those purposes is in the patent/monograph record.

Recommended revision: Keep Section 8, but mark it as an editorial-method thesis of the Annals, not as a consequence of US 12,195,423 or of monographs 1–12. Point the molecule’s founding role at H and at Axiom A_1 , which is what those documents actually fix.

Issue 10. “Admissible foundational region” analogizes A_{12} vocabulary onto a review predicate

Location: Definition 2; Figure 1; source Axiom A_{12} .

Classification: Terminological drift.

Severity: Editorial.

In the source, Ω_{adm} and d_C^* are structural-state constructions. In the survey, $F_{\text{adm}} := M \cap C \cap H$ is a set of manuscript assertions. The analogy is deliberate and is explained. The risk is that later papers will treat F_{adm} -membership as if it were A_{12} admissibility, or treat a failed chemistry review as “topological scission.”

No sentence in the survey identifies the two objects. The shared adjective “admissible” is the whole problem.

Recommended revision: Keep Definition 2. Once, in Section 4.2, state that F_{adm} is not Ω_{adm} and that a review exclusion is not a metric disconnection.

Issue 11. Identification Hypothesis Φ is corpus-native, not twelve-axiom-native

Location: Section 7.2 and Section 9.2; source Section 11.

Classification: Terminological / structural continuity (not an error).

Severity: Editorial.

$\Phi : G_C \simeq L$ is introduced in Volume 1, Number 1, paper 17. It does not appear in A_1 – A_{12} or in the deferred list of source Section 11. The survey correctly treats Φ as a realization hypothesis in the sense of the source’s Definition 3. It should not be read as a thirteenth axiom or as a missing deferred theorem of the twelve-axiom paper.

No revision required beyond a parenthetical: “ Φ is a paper-17 hypothesis, not a target of source Section 11.”

2.3. Head-by-head concordance.

2.3.1. *Thesis A*. Concordant, with compression.

The deferred list is the source’s Section 11 list, slightly merged (Issue 7). Non-vacuity and sequence-induced noncommutativity are the right established core (source Theorems 61 and 8). Papers 13 and 34 are genuine extensions, not axioms. Nothing in Thesis A attributes to the field a programme that the molecule cannot motivate, provided paper 34 remains labelled as an extension of an undischarged GF(4) target.

Omitted molecule-native mathematics: C_{2h} , attachment inequivalence, bipartiteness, bay/K geometry (Issue 8). Those omissions thin the portrait; they do not replace it with a different field.

2.3.2. *Thesis B*. Supported as a biogenesis programme; under-representing as a chemical programme.

Origination, homochirality, and macro-evolutionary stability are in provisionals 64/091,432–64/098,432, 63/985,933, and 63/914,395–63/923,654, and in the Volume 1 biological fibre. They are not injections.

The founding chemical claim — encoded synthesis of nucleic acids and phospholipids, plus pharmaceuticals — is not used as evidence for Thesis B (Issues 1–2). Therapeutic, photoreceptor, enzyme-templating, and TPD filings are likewise outside the thesis statement. Thesis B is therefore narrower than the molecule’s biological record, not broader. That is omission, not injection. It does not require rewriting Thesis B as a different thesis; it requires attaching the granted claim to the thesis that already names biogenesis.

No biological claim in Section 7.2 is untraceable to the papers-plus-provisionals record. Hopane/sterane, kerogen, and geoporphyrin are journal-fibre arguments rather than granted-claim arguments; the survey presents them as checks against an existing record, which is the correct strength.

2.3.3. *Category taxonomy.* Complete against the twelve monographs at coarse grain; incomplete against the forty-eight provisionals.

Every Table 1 label has a monograph volume and at least one provisional. No label is an injection relative to that record. Photoreceptor/optical, neuromorphic/biomanufacturing, and TPD/metallopeptide systems are first-class in the filing map and are not first-class in Table 1 (Issue 3). Section 2 overstates the match.

2.3.4. *Review-tier allocation.* Correct set, incomplete set.

Framework, A_7/A_9 hardware, and healthcare are the right inclusions. Chemical-materials and templated-synthesis submissions are the missing inclusion (Issue 4). Finance is correctly left on Level 1.

2.3.5. *Provenance.* Countably accurate; descriptively incomplete.

Two grants, forty-eight provisionals, twelve volumes, date window: correct. Granted subject matter, pre-monograph versus volume-tracking blocks, bibliographic keys, and companion pagination: not correct (Issues 1 and 5).

2.3.6. *Recalled formal core.* Faithful ladder and theorem numbers; two scope-changing caveats dropped.

See Issues 6–7. The survey does not reinstate the banned implications (anisotropy, GF(4), scission). It does not weaken A_8 back out of the foundation. That was the stated purpose of the twelve-axiom reconstruction, and the survey preserves it.

2.3.7. *AI-collaborator framing.* Concordant with the journal’s self-description; not present in the founding patent/monograph record.

Issue 9. Do not treat Section 8 as a scientific extension of US 12,195,423.

2.3.8. *Terminology.* Continuous, with one analogical reuse.

Sequence algebra, dual cipher, tensor $\Psi_{\mathfrak{C}}$, $\text{Ext}_{12}(\mathfrak{C}^{\text{chr}})$, d_C^* , Ω_{adm} keep their source meanings. F_{adm} is new and analogical (Issue 10). Φ is corpus-native (Issue 11). I_C manifold language from Volume 1, Number 1 is not recycled as if it were A_1 – A_{12} . That is the right direction of travel after the twelve-axiom restatement.

2.4. What is not a concordance failure.

- Finance and AGI-containment as published categories — present in monographs 8, 11, 12 and provisionals 64/106,983, 64/110,131, 64/111,029.
- Paper 34 as evidence of an open frontier — allowed if GF(4) remains deferred.
- Level 1 review of Volume 1, Number 1 — a historical fact of that issue, not a claim that Level 1 is F_{adm} .
- The Identification Hypothesis as unproved — concordant with both the source’s realization-hypothesis tier and paper 17’s own caveat.
- Refusal to treat $d_C^* = +\infty$ as physical scission — required by source A_{12} and Remark 38.

2.5. Disposition (concordance).

Concordant with Minor Revisions

“Requires Structural Reconstruction” is reserved for a core mischaracterization of Thesis A or Thesis B. That bar is not met. Thesis A is the source’s programme. Thesis B is a supported origination programme that needs the granted synthesis claim attached to it, not a different thesis substituted for it. The taxonomy needs a portfolio-remainder paragraph, not a new seven-way split. The review-tier list needs one added class. Section 3 needs two caveats restored.

A disposition of Concordant as Submitted would ignore Issues 1–6, which a concordance reader of the patents and of source Remarks 42 and 44 would actually see.

2.6. **Concordance rubric.** Scores are 0–10. They are not averaged into the disposition.

#	Category	Score	Note
1	Thesis A vs. molecular mathematics	8	Deferred list right; C_{2h} , bipartiteness, b
2	Thesis B vs. patent chemistry	6	Origination supported; granted NA/phospholi
3	Taxonomy vs. full portfolio	6	Seven fibres match monographs; three filing o
4	Absence of injected areas	8	No fake domain relative to the record; Langlan
5	Section 3 vs. twelve-axiom source	8	Ladder and theorem numbers right; locant ar
6	Review-tier allocation	7	Three classes right; materials/ H class
7	Provenance completeness	7	Counts right; titles, blocks, keys, pag
8	AI-collaborator vs. founding record	7	Journal method, not patent cont
9	Terminological consistency	8	One analogical reuse of “admissi
10	Continuity with Vol. 1 No. 1 and A_1 – A_{12}	8	Direction of travel is the reconstruction, not the ol
Total		73	

2.7. Minimal concordance repairs.

- (1) Quote US 12,195,423 and US 12,473,247 by claimed subject matter in Section 2.

- (2) In Section 7.2, attach nucleic-acid and phospholipid synthesis to Thesis B as the founding chemical content.
- (3) Add a portfolio-remainder note for photoreceptor/optical, neuromorphic/biomanufacturing, and TPD/metallopeptide filings.
- (4) Extend Section 4.5 to claims evaluated against H for the reference reduct, not only to “healthcare.”
- (5) Restore the source caveats: locant frame retained not derived; $\text{Mod}(\mathcal{A})$ not categorical; $H_{\partial\pi}$ is the chemical hypothesis.
- (6) Split real structure from spectral dimension in the deferred list; record that $J_{\text{dc}}^2 = I$ is A_8 .
- (7) Label Section 8 as an Annals-method thesis.
- (8) Disentangle bibliographic keys for the twelve-volume series, volume 2, and the provisional list; correct the companion page range to 405–476.

3. INDEPENDENT MATHEMATICAL AND LOGICAL REVIEW (VERBATIM)

Standalone mathematical and logical audit — not an editorial endorsement

Title. The Chrysene Formalism as Candidate Mathematics and Candidate Biogenesis: A Quantitative and Categorical Survey of Volume 1, Number 1.

Author of record. Standalone review for the *Annals of the Chrysene Formalism*.

Venue. *Annals of the Chrysene Formalism*, ISSN 3144-2021.

Date. 11 September 2026.

Disposition. Accept with Minor Revisions. Rubric total: 78/100.

Abstract of the mathematical and logical review

This report is an independent mathematical and logical audit of Schaper, C. D., “The Chrysene Formalism as Candidate Mathematics and Candidate Biogenesis: A Quantitative and Categorical Survey of Volume 1, Number 1,” *Annals of the Chrysene Formalism* 1(2) (2026). The audit addresses definitions and domains; logical dependency; the proofs of Propositions 3 and 4 against the issue ledger; logical-status discipline; the deductive/empirical distinction; faithfulness of restated companion-paper material; internal consistency; and overreach. Two original propositions are valid given the paper’s own data. No central deductive claim is formally invalid. Recurring defects are citation and pagination collisions, a truncated sentence in Section 10, a false frequency claim in Appendix A.7, an incomplete technique census in Section 5, and modest overstatement in the abstract relative to what is proved in the body. Recommendation: **Accept with Minor Revisions**. Rubric total: **78/100**.

3.1. Mandate and scope. The manuscript under review is an editorial survey. It does two distinct things:

- (1) It *restates*, without reproof, a twelve-axiom formal core, two theorems, and a deferred-theorem schema attributed to a companion paper [4].
- (2) It *introduces* its own objects and claims about a 38-paper corpus: Definitions 2–5, Propositions 3–4, Remarks 1–2, and Theses A–B.

This review treats those two layers separately. Companion results that are only cited are checked for accurate restatement and for correct logical status; they are not independently re-proved here, because the companion manuscript is not the object of this audit. Corpus classifications were checked against the Volume 1, Number 1 issue ledger supplied with the submission.

Severity labels:

- **Major:** invalidates or significantly weakens a central claim.
- **Minor:** a real defect, correctable without changing the paper’s conclusions.

- **Editorial:** wording, notation, pagination, or presentation only.

3.2. Mathematical-logical issue register.

Issue 1. Title / citation mismatch on the surveyed volume

Location: Title page versus citation block, p. 1.

Severity: Editorial (borderline minor).

The title and abstract correctly describe a survey of Volume 1, *Number 1*. The citation block on the same page titles the paper as a survey of Volume 1, *Number 2*. That is a false self-description of the object of study.

Recommended revision: Make the citation title identical to the article title. The surveyed object is Vol. 1 No. 1; the venue of publication is Vol. 1 No. 2.

Issue 2. Pagination collision with the companion paper

Location: Citation line, p. 1; Section 2, parenthetical self-correction; references [4].

Severity: Minor.

This article is paginated 476–488. The companion [4] is cited as 1(2):476–547. Two articles cannot occupy the same starting page. Section 2 notes “a citation inconsistency in [4]’s own self-reference,” but the collision is also present in *this* paper’s reference list. The note in Section 2 does not discharge the inconsistency; it records it and leaves it in place.

Recommended revision: Assign disjoint page ranges before publication. Do not leave a known bibliographic collision in the official citation of the paper that is supposed to be the formal core.

Issue 3. Truncated sentence at the close of Section 10

Location: Section 10, final paragraph (“What remains unaddressed”).

Severity: Minor.

The paragraph ends:

“This is, on the evidence assembled in this paper, the single largest gap between Thesis B as stated (Section 7.2) and Thesis B as established, and it is not, at the time of this writing,”

The predicate is never completed. The next unit is Section 11. A section whose purpose is to state which limitations remain open cannot itself end mid-clause.

Recommended revision: Complete the sentence. A minimal repair: “...and it is not, at the time of this writing, closed by either opening paper of Volume 1, Number 2.”

Issue 4. False frequency claim for H_∞ control

Location: Appendix A.7; compare Table 2 and Section 5.

Severity: Minor.

Appendix A.7 states that H_∞ robust control “is the single most frequent technique in the corpus (Table 2, 8 papers).” Table 2 in the same paper lists thermodynamics / statistical mechanics at 11 papers (28.9%) and category / topos theory at 9. H_∞ is tied for third at 8. The claim is false on the paper’s own table.

Recommended revision: Replace “the single most frequent technique” by “among the most frequent techniques” or report the actual rank (tied third).

Issue 5. Incomplete census of the twenty-element technique vocabulary

Location: Section 5, paragraph following Table 2.

Severity: Minor.

The paper states that $\mathcal{T}$ has twenty techniques, exhibits nine in Table 2, and then lists the “remaining eleven.” The list names ten techniques (optimal transport; Monte Carlo; finite fields; Hamilton–Jacobi–Isaacs; SDEs; representation theory / geometric Langlands; general relativity; generative AI; KAM; automata) and omits discrete Morse theory. Discrete Morse theory is in the issue ledger with $|T^{-1}| = 2$ (papers 23 and 24) and is discussed at length in Section 6 and Appendix A.5. Nine plus ten is nineteen, not twenty.

The same paragraph groups six techniques as having count in $\{3, 4\}$. That grouping is correct for the six named items; discrete Morse theory belongs with the count-2 pair, which is why its omission is not a mere label slip.

Recommended revision: Add discrete Morse theory to the residual list, with count 2, and change “eleven” only after the list actually contains eleven items.

Issue 6. Wrong section reference for the crossed-product algebra

Location: Appendix A.2.

Severity: Editorial.

Appendix A.2 attributes “the crossed-product sequence algebra $\mathfrak{A}_{\mathfrak{C}} = \Omega_{\mathfrak{C}} \rtimes_{\alpha} \mathbb{Z}^3$ of Section 4.3.” Section 4.3 is the orthogonal review pipeline. The algebra is defined in Section 3.3.

Recommended revision: Change “Section 4.3” to “Section 3.3.”

Issue 7. Abstract overstates Proposition 4

Location: Abstract; Proposition 4 and its proof, Section 6.

Severity: Minor.

The abstract says the editorial-category classification and the molecular-versus-mathematical classification “are shown to be logically independent by direct

exhibition.” Proposition 4 proves only one direction: Basis is not constant on every fibre of Cat. That is non-collapse of Basis under Cat, not logical independence of the two maps.

Independence in the usual sense also requires that Cat is not constant on every fibre of Basis. The data in Section 6 do in fact supply witnesses (e.g. papers 3 and 6 are both Math and lie in different categories; papers 28 and 16 are both Mol and lie in different categories), but those witnesses are not assembled into a proposition.

Recommended revision: Either weaken the abstract to match Proposition 4, or add a one-line companion statement that Cat is likewise non-constant on the fibres of Basis, with two explicit witnesses.

Issue 8. Basis is used before it is defined

Location: Definition 4 (Section 5); Definition 5 (Section 6).

Severity: Editorial.

Definition 4 includes $\text{Basis}(i)$ as a coordinate of the corpus tuple. Definition 5, which specifies the domain and codomain of Basis, appears only in the next section. A reader who takes definitions in order meets an undefined map.

Recommended revision: Move Definition 5 immediately before Definition 4, or insert in Definition 4 a forward pointer that states domain and codomain: $\text{Basis} : I \rightarrow \{\text{Mol}, \text{Math}\}$.

Issue 9. Abusive inverse-image notation for techniques

Location: Definition 4 and Table 2, Section 5.

Severity: Editorial.

T is declared as $T : I \rightarrow 2^{\mathcal{T}}$. The paper then writes

$$|T^{-1}(\tau)| := |\{i \in I : \tau \in T(i)\}|.$$

If T takes values in the power set, the ordinary inverse image $T^{-1}(\tau)$ is empty unless some paper’s technique *set* equals the singleton-or-element τ . The displayed formula is the correct counting function (the number of papers that invoke τ), but it is not T^{-1} .

Recommended revision: Define an occurrence count $n(\tau) := |\{i \in I : \tau \in T(i)\}|$ and use $n(\tau)$ in Table 2. Keep T^{-1} only if T is re-typed as a relation $I \multimap \mathcal{T}$.

Issue 10. Overloaded identifier H

Location: Definition 1; Definition 2; Axiom 2.

Severity: Editorial.

In a short span the letter H denotes (i) the additional-hypothesis set $H_{\mathfrak{R}}$ of a deferred theorem, (ii) the chemical-admissibility subset of $\mathcal{P}$ in Definition 2, and (iii) implicitly the Hilbert space of the spectral triple in Section 3.4. Concordance C is likewise adjacent to constraint functionals C_j in Axiom 2. None of these collisions produces an actual ambiguity in context, but they are unnecessary.

Recommended revision: Reserve H for chemical admissibility (Definition 2). Write $\text{Hyp}(\mathfrak{R})$ or $\mathcal{H}_{\mathfrak{R}}$ in Definition 1. Write $\mathcal{H}_{\omega}$ consistently for the Hilbert space.

Issue 11. Local axiom numbering collides with the twelve-axiom labels

Location: Sections 3.2 and 3.4.

Severity: Editorial.

“Axiom 1” in this paper is A_1 of the companion system. “Axiom 2” in this paper is A_{12} . A reader who later sees “the twelve axioms A_1 – A_{12} ” and “Axiom 2” in the same document can assign the wrong object to the second label.

Recommended revision: Refer only to A_1 and A_{12} , or call them “Axiom A_1 (restated)” and “Axiom A_{12} (restated).” Do not recycle the integers 1 and 2.

Issue 12. Objects used without a local definition

Location: Theorem 2; Definition 1; Section 3.3–3.4.

Severity: Minor for self-containedness; not a validity failure.

The following objects are essential to the restated core and are not defined in this manuscript: $\text{Ext}_{12}(\mathfrak{C}^{\text{chr}})$, the quasi-local algebra $\mathfrak{Q}_{\mathfrak{C}}$, the fibre $K_{\mathfrak{C}}$, the embedding maps ι_k , the compact-resolvent operator $D_{\mathfrak{C}}$, and the comparison class B_4 . The paper says, correctly, that it reproduces only what later arguments need and that full proofs live in [4]. That disclaimer is adequate for a survey. It is not adequate if Thesis A is to be *established* in this document rather than *pointed to*.

Recommended revision: Add a one-paragraph “notation from [4]” block listing $\text{Ext}_{12}(\mathfrak{C}^{\text{chr}})$, $\mathfrak{Q}_{\mathfrak{C}}$, and B_4 with their intended types. Keep proofs in the companion.

Issue 13. Abstract and Section 8 slightly outrun Remark 1

Location: Abstract; Section 8; Remark 1; Section 9.4.

Severity: Minor.

The abstract concludes that AI-augmented generation bound to the patented reference “behaves as a constrained collaborator rather than an unconstrained one.” The body is more careful. Remark 1 is labelled an empirical finding about one coded ledger of 63 actions on one manuscript. Section 9.4 states

that the orthogonal architecture has not been applied to the 38-paper corpus, that the case study is retrospective and unblinded, and that generalization is future work. The abstract drops those qualifications.

The inference “three review layers produced different correction profiles, therefore an external reference disciplines generation” is a methodological interpretation of a single $n = 1$ ledger. It is not a theorem, and the paper does not call it one. The abstract should not read as if it were.

Recommended revision: In the abstract, replace the unconstrained/constrained sentence by a clause that names the evidential base: a single retrospective case study, not yet extended to the corpus.

Issue 14. Duplicated paragraph in Section 4.3

Location: Section 4.3, the two consecutive paragraphs that each begin “Figure 2 depicts this structure.”

Severity: Editorial.

The same three-sentence block is printed twice.

Recommended revision: Delete the duplicate.

Issue 15. Series title versus bibliographic title

Location: Section 2; references [2], [3].

Severity: Editorial.

Section 2 cites a twelve-volume series titled *The Mathematical Structure of Reality* as [2]. The reference list entry [2] is a single monograph with a different title. Section 2 cites “forty-eight provisional patent applications [3]”; the reference list entry [3] is a monograph containing a provisional-patent list on page 212, not the applications themselves.

Recommended revision: Cite the series by series title and list volume ISBNs, or cite the specific volume used. Cite the patent office documents directly for the forty-eight provisionals.

Issue 16. Theorem 1 proof sketch contains unused data

Location: Section 3.3, proof sketch of Theorem 1.

Severity: Editorial.

The sketch introduces an unused unit vector e_1 and an unused two-site tensor factor $K_k \otimes K_{k+m}$. The identity that actually yields noncommutativity is the covariance relation

$$u_m P_k = \alpha_m(P_k) u_m = P_{k+m} u_m,$$

hence $[u_m, P_k] = (P_{k+m} - P_k)u_m$, which is nonzero once $P_{k+m} \neq P_k$ and u_m is unitary. That argument does not need e_1 .

This is a restated companion theorem. The sketch is not formally wrong; it is incomplete as a sketch and slightly padded.

Recommended revision: Either drop e_1 and the two-site sentence, or write the one-line identity above and keep the citation to [4, Thm. 8] as the complete proof.

Issue 17. Proposition 3 is tautological — not a defect of validity

Location: Definition 2; Proposition 3.

Severity: Editorial (status, not error).

Proposition 3 is the statement that membership in an intersection is joint membership in the factors. The proof is correctly marked “immediate from Definition 2.” The proposition is used later as the precise sense in which Level 1 review is weaker than F_{adm} -admissibility. That use is conceptually legitimate. The result should not be advertised as a nontrivial theorem.

No revision is required for correctness. Optional revision: demote Proposition 3 to a remark immediately under Definition 2.

Issue 18. “Candidate field” rests on unexamined companion theorems

Location: Section 7.1, conditions (i)–(ii); Theorem 2.

Severity: Minor as a scope limitation, not as an internal contradiction.

Thesis A is defined to require a non-vacuous axiomatic foundation and an established core of results proved from that foundation. In this paper both are citations: Theorem 2 points to [4, Thm. 61 and Apps. A–B]; Theorem 1 points to [4, Thm. 8]. This paper does not verify those proofs. It also does not pretend to. Section 3 opens by saying the core is recalled “without reproof.”

The limitation is epistemic, not logical: a reader who does not accept the companion proofs is not compelled by this paper to accept Thesis A. The paper’s own hedging (“candidate,” “lower bound,” “sociological judgment external to any single journal”) already records that fact. Flagged so that Thesis A is not mistaken for a theorem of *this* manuscript.

Recommended revision: In Section 7.1, add one sentence: conditions (i) and (ii) are imported from [4] and are not re-established here.

3.3. Audit against the eight required heads.

3.3.1. *Definitions, object types, and domains.* The paper’s own defined objects are as follows.

Object	Declared type	Assessment
$\mathcal{P}$	set of candidate assertions	Informal but usable. No construction of $\mathcal{P}$ is given; it is a universe of discourse.
$M, C, H \subseteq \mathcal{P}$	judgment-subsets	Typed as subsets. The membership tests are editorial predicates, not mathematical ones. That is appropriate for a review-architecture definition and should not be read as a Σ_1 property.
$F_{\text{adm}} := M \cap C \cap H$	subset of $\mathcal{P}$	Domain and codomain unambiguous.
$I = \{1, \dots, 38\}$	index set	Clear.
$\text{Cat} : I \rightarrow \mathcal{C}$	total function onto seven labels	Clear. Induces a partition, as claimed.
$T : I \rightarrow 2^{\mathcal{T}}$	set-valued map	Clear, except for the inverse-image abuse (Issue 9).
$\text{Basis} : I \rightarrow \{\text{Mol}, \text{Math}\}$	total function	Clear once Definition 5 is reached (Issue 8).
$\text{Tier} : I \rightarrow \{1\}$	constant function	Clear.
$\mathcal{K}$	indexed 6-tuple family	Clear.
Deferred theorem (Def. 1)	syntactic schema	The sequent form $\mathcal{A} \cup H_{\mathfrak{R}} \models P_{\mathfrak{R}}$ while $\mathcal{A} \not\models P_{\mathfrak{R}}$ is the correct notion. Quantifiers on $\mathfrak{R}$ and $H_{\mathfrak{R}}$ are explicit.
d_C^*	extended path metric	Formula (4) is a standard extended-metric construction. Domain $\Omega_{\text{adm}} \times \Omega_{\text{adm}}$, codomain $[0, \infty]$.

Quantifiers on Propositions 3 and 4 are correct: universal on $\mathfrak{p} \in \mathcal{P}$ for Proposition 3; existential on a fibre of Cat for Proposition 4.

No definition assigns an object to the wrong type. The gaps are missing local types for companion-paper objects (Issue 12) and the two notation collisions (Issues 9–11).

3.3.2. Logical dependency and circularity. The dependency order of *this* paper's original claims is acyclic:

Def. 2 $\rightarrow$ Prop. 3; Def. 4, Def. 5 $\rightarrow$ Prop. 4; Def. 1, Thm. 2 (cited) $\rightarrow$ Thesis A.

No proposition is invoked before it is stated. Proposition 3 is not used in the proof of Proposition 4. Remark 1 is not used as a hypothesis of either proposition.

Forward references exist (Section 2 cites H and Theorem 2 before those sections; Definition 4 cites Basis before Definition 5). Those are presentation issues, not circular arguments.

The inferential convention (1) is informal and is not used as a hidden premise in any proof. The three displayed non-implications (2)–(3) are restraints, not derivations; they are consistent with Definition 1.

There is no point at which a proof assumes its own conclusion.

3.3.3. Correctness of each proof.

Proposition 3 (Non-substitutability). Statement: $\mathfrak{p} \in F_{\text{adm}}$ if and only if $\mathfrak{p} \in M$, $\mathfrak{p} \in C$, and $\mathfrak{p} \in H$ hold jointly; failure of any one factor excludes $\mathfrak{p}$ from F_{adm} .

This is the definition of intersection. The proof is valid. The “in particular” clauses are the only direction later used, and they follow.

Proposition 4 (Non-collapse of Basis under Cat). Statement: Basis is not constant on every fibre of Cat.

The proof exhibits two fibres. Both were checked against the issue ledger.

Fibre	Ledger indices	Basis values
Medical & Pharmacological Networks	{6, 7, 8, 14, 28, 32}	28 = Mol; 6, 7, 8, 14, 32 = Math
Cosmological & Biological Emergence	13 papers, including 3	3 = Math; the other twelve = Mol

The medical index set stated in the paper is exactly the ledger fibre. Paper 3 is the unique mathematical paper in the cosmological fibre. Each fibre therefore contains both values of Basis. Two independent witnesses are more than the existential claim requires.

Caveat, not an error: the “proof” is an exhibition of an author-coded classification, not a derivation from the twelve axioms. Given that Cat and Basis are defined as that classification, the exhibition is the correct proof form. A second coder is not required for the implication “these two functions, as specified, do not collapse.” Section 9.4 already records that the taxonomy is single-coder.

Theorem 1 and Theorem 2. Not original proofs. Theorem 1’s local sketch is compatible with the crossed-product covariance identity (Issue 16). Theorem 2 is a pure citation. Neither proof in this paper is circular.

3.3.4. *Logical-status discipline.* The paper is, on this axis, unusually careful.

- Definition 1 is a definition of a class of unproved targets. The eight named items (closure law, $\text{GF}(4)$ multiplication, transfer anisotropy, spectral–path reconstruction, spectral dimension, braiding, emergent chirality, dynamical scission) are not later treated as theorems.
- Equation (2) explicitly blocks the inference $|\Sigma_{\mathfrak{C}}| = 4 \Rightarrow \Sigma_{\mathfrak{C}} \cong \text{GF}(4)$. Paper 34’s Langlands discussion is not used to discharge that inference.
- Equation (3) blocks reading $d_{\mathfrak{C}}^* = +\infty$ as physical scission. Axiom A_{12} is stated with that restraint attached.
- Axiom A_1 is not allowed to identify the reduct with chrysene; that identification is located in Theorem 2.
- Section 4.5’s scope rule is labelled a realization hypothesis, not a theorem.
- Theses A and B are introduced as candidate programs with listed unproved premises. Section 9 repeats the premises. Section 11 does not promote either thesis.

Inconsistent hedging appears only in the abstract (Issues 7 and 13) and in Appendix A.7’s frequency claim (Issue 4). Those are not status promotions of a deferred theorem to a theorem.

No definition is labelled a theorem. No realization hypothesis is labelled an axiom.

3.3.5. *Deductive versus empirical claims.* The distinction is maintained in the body.

- Propositions 3 and 4 are deductive relative to Definitions 2, 4, and 5.
- Remark 1 is titled “Empirical Finding,” is restricted to one coded ledger, and is explicitly “not a deduction from Definitions 2–3.”
- The 34/4 single-round versus two-round split, the 25/2/11 model-usage split, and the category and technique tables are reported as corpus facts, not theorems.
- Section 8’s “constrained collaborator” claim is argued from Remark 1 and then bounded by Section 9.4. The bound is the right one. The abstract does not carry the bound (Issue 13).

No empirical percentage is used as a hypothesis of a proposition. Arithmetic of Remark 1 checks: $22/63 = 34.9\%$, $20/63 = 31.7\%$, $59/63 = 93.7\%$, $48/63 = 76.2\%$, $55/63 = 87.3\%$, $35/63 = 55.6\%$, $9/63 = 14.3\%$, $8/63 = 12.7\%$.

3.3.6. *Faithfulness of restated material.* Signalling is correct. Section 3 states that the twelve-axiom system is restated from [4] and that proofs are not reproduced. Theorem 1 cites [4, Thm. 8]. Theorem 2 cites [4, Thm. 61 and Apps. A–B]. That is the required “restated, not reproved” mark.

What this review can and cannot certify:

- The local statements of A_1 , A_7 , A_9 , A_{12} , Theorem 1, Corollary 1, Theorem 2, and Definition 1 are internally coherent and use standard vocabulary of crossed products, spectral triples, and extended path metrics.
- This review does *not* certify that [4] in fact proves Theorem 61, that the seven-polyhex enumeration is exhaustive, or that the Dirac operator displayed there has compact resolvent. Those are companion-paper claims.
- Appendix A correctly treats Die17, Con94, BR87, MLM94, For98, ZDG96, Vil09, LN97 as background machinery rather than as proofs of chrysene-specific theorems. Appendix A.4 correctly says Frenkel’s loop-group Langlands correspondence does not itself establish paper 34’s finite-field adaptation.

The only restatement error found is the Section 4.3 pointer in Appendix A.2 (Issue 6).

3.3.7. *Internal consistency.* Stable across the paper: $F_{\text{adm}} = M \cap C \cap H$; Level 1 versus orthogonal review; Mol/Math basis; seven-category partition; 38 papers, pages 1–475; deferred-theorem list; Identification Hypothesis Φ as unproved.

Unstable or incorrect:

- Title versus citation volume number (Issue 1).
- Page range 476–488 versus [4] at 476–547 (Issue 2).
- “Axiom 2” versus A_{12} (Issue 11).
- Appendix A.2 section number (Issue 6).
- Appendix A.7 versus Table 2 on H_∞ rank (Issue 4).
- Residual technique list versus $|\mathcal{T}| = 20$ (Issue 5).
- Duplicated Figure 2 paragraph (Issue 14).
- Section 10 sentence fragment (Issue 3).

Category counts, Mol/Math split (20/18), and review-structure counts match the ledger exactly. Those are the classifications on which Propositions 3–4 and Section 6 depend, and they are consistent.

3.3.8. *Overreach*. The paper does not treat Thesis A or Thesis B as theorems. Section 11 is explicit that both stand or fall on results not yet obtained. That is the correct strength.

Places where the wording is stronger than the local evidence:

- (1) Abstract: “logically independent” (Issue 7).
- (2) Abstract: “constrained collaborator rather than an unconstrained one” (Issue 13).
- (3) Section 7.1: “established core of results actually proved from that foundation” — established in the companion, not here (Issue 18).
- (4) Appendix A.7: “single most frequent technique” (Issue 4).

None of these quietly converts “candidate field” into “established field.” The conclusion restates the candidate status and the unequal evidential weight of the two theses. Overreach is present and local; it is not the architecture of the argument.

3.4. **What the paper gets right.** These points are recorded so that the issue list is not mistaken for a general finding of invalidity.

- Definition 2 and Proposition 3 correctly isolate a conjunctive admissibility criterion. The methodological moral — a single coherence predicate cannot detect which factor fails — does not require a deep theorem, and the paper does not pretend otherwise in the body.
- Definition 1 is the right device for keeping realization hypotheses out of the axiom list. The three displayed non-implications (2)–(3) are enforced in later sections.
- Proposition 4 is correctly proved by exhibition, and the exhibition matches the ledger.
- Theses A and B are stated with their unproved premises attached. Section 9.2 does not let the empirically anchored biological papers discharge Φ .
- Remark 1 is not laundered into a theorem. Section 9.4 lists the design defects of the case study (retrospective coding, no blinded second coder, no randomized model assignment, human concordance judgment).
- Section 10 distinguishes which limitations Volume 1, Number 2 addresses from the limitation it does not (experimental discharge of Φ). The truncated last sentence does not undo that distinction; it merely fails to finish one clause.

3.5. **Summary judgment (mathematical-logical).**

Accept with Minor Revisions

No major issue remains in the sense of the rubric: no original proposition is invalid, no deferred theorem is sold as a theorem, and no empirical ledger is sold as a proof. The paper’s own mathematical content is thin — two propositions, one of them tautological — but what it proves, it proves. The

defects that must be repaired before publication are bibliographic (Issues 1–2, 15), quantitative (Issues 4–5), and production-level (Issues 3, 6, 14). The abstract should be aligned with Proposition 4 and Remark 1 (Issues 7, 13). A recommendation of Accept with Major Revisions would be appropriate only if Thesis A were treated as a theorem of this manuscript, or if Proposition 4’s witnesses failed against the ledger. Neither occurred.

What would change the recommendation. Failure to correct the page-range collision and the truncated Section 10 sentence would be a production bar, not a mathematical one. Discovery that the companion proofs cited for Theorems 1 and 2 do not exist or do not match the restated statements would be a major issue against Thesis A; that discovery cannot be made from this manuscript alone.

3.6. Mathematical-logical rubric. Scores are 0–10 in each category. They are not averaged into the accept/reject decision.

#	Category	Score	Note
1	Definitional rigor	8	Own objects are typed; companion objects are not; T^-
2	Validity of proofs	9	Prop. 3 and Prop. 4 hold. Thm. 1 sketch is sloppy
3	Logical-status discipline	9	Deferred theorems, realization hypotheses, and theses
4	Deductive / empirical distinction	9	Remark 1 and the tables are not treated as theorems
5	Faithfulness of restated material	7	Signalling is correct; companion proofs are unchecked here
6	Internal consistency	6	Volume number, pagination, H_∞ rank, technique censured
7	Epistemic hedging	8	Body is honest; abstract is one notch too high
8	Citation accuracy	6	Page collision; series/monograph mismatch; provisionality
9	Clarity of exposition	8	Structure is readable; local axiom numbers and identifiers
10	Overall coherence	8	The survey argument holds together and knows where it is going
Total		78	

3.7. Minimal revision list for the authors (mathematical-logical).

- (1) Align the citation title with the article title (Vol. 1 No. 1 is the surveyed object).
- (2) Disjoint the page range from [4].
- (3) Finish the last sentence of Section 10.
- (4) Delete the duplicated Figure 2 paragraph.
- (5) Correct Appendix A.7: H_∞ is not the most frequent technique.
- (6) Add discrete Morse theory to the residual list in Section 5.
- (7) Change “Section 4.3” to “Section 3.3” in Appendix A.2.
- (8) Weaken the abstract’s “logically independent” and “constrained collaborator” clauses, or supply the missing converse witnesses and the $n = 1$ qualifier.
- (9) Define Basis before using it in Definition 4.

- (10) Add a one-sentence notice in Section 7.1 that conditions (i)–(ii) of Thesis A are imported from [4].

FINAL REMARKS FROM THE EDITORIAL REVIEW COMMITTEE CHAIR

The editorial compilation of the three orthogonal-constraint reviews has been completed. The chemistry stage found no false molecular claim and scored 81/100. The concordance stage found no injected domain and no reconstructed thesis, and scored 73/100. The mathematical-logical audit found both original propositions valid and scored 78/100. The consolidated recommendation is **Accept with Minor Revisions**.

The manuscript is formally accepted for publication in the *Annals of the Chrysene Formalism*, Volume 1, Number 2, ISSN 3144-2021, pages 476–488, article 39. Acceptance date: 2026-09-11. Online publication date: 2026-09-29.

REVISION HISTORY

Version	Date	Notes
v1.0	2026-09-29	Initial publication.

Living Document Notice

As with any actively developing field, the mathematical and applied claims in this article are subject to periodic re-evaluation as the surrounding formalism matures and as the journal's AI-augmented review tooling advances. Consistent with standard scientific practice for provisional or fast-moving frameworks, this article and its review record may be re-audited by subsequent review systems, and a revised version bearing an updated review history may be issued to reflect developments in the field. Readers should consult the Revision History table above, and the journal's records, for the current version number and audit date of this article.

Editorial Disclaimer

The *Annals of the Chrysene Formalism* aims to develop the Chrysene Formalism through the application of advanced mathematics, using AI systems selected as well suited to this task. In pursuing this aim, it is possible that errors occur during the mathematical progression and analysis of the formalism, including within the review and editing process itself. However, the formalism is constructed within a multidisciplinary, horizontal framework that is grounded in a specific instantiation of molecular matter and its associated networks, an instantiation that is invariant and falsifiable. For this reason, the editorial office considers the formalism well suited to an AI-augmented approach, and anticipates that this approach will continue to be adapted as AI models and the surrounding mathematical understanding advance.

REFERENCES

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