ANNALS OF THE CHRYSENE FORMALISM

AI-AUGMENTED PEER-REVIEWED | VOL. 1, NO. 4 | ISSN 3144-2021 | OCTOBER 2026

ORTHOGONAL REVIEW RECORD

The Completeness Condition: Realisation of the Twelve-Axiom Framework at a Site of the Interior Chrysene Lattice, and the Genome Length It Requires

Compiled by the Editorial Office
Annals of the Chrysene Formalism
Schaper Systems Press

Paper ID:	ACF-1.4-080
Issue:	Volume 1, Number 4
ISSN:	3144-2021
Review architecture:	Same-model consistency pass followed by independent-model referee report
Review focus:	Completeness condition, site-level realisation, genome threshold, Minkowski-sum containment
Acceptance date:	2026-10-28
Online publication:	2026-10-28
Pages:	1639–1651
Document version:	v1.0
Last audited:	28 October 2026

Citation: Schaper, C. D. (2026). The Completeness Condition: Realisation of the Twelve-Axiom Framework at a Site of the Interior Chrysene Lattice, and the Genome Length It Requires. *Annals of the Chrysene Formalism*, 1(4), 1639–1651. ISSN 3144-2021. `https://chrysene.com/index.php/acf/article/view/80` • © 2026 Charles D. Schaper. Distributed under the CC Attribution-NonCommercial-NoDerivatives 4.0.

Declared conflict

The first report was produced by the same model instance that drafted the manuscript, in the same session. It is an author-side consistency pass of unusual depth, not an independent editorial review. A subsequent independent-model referee report was prepared for the Editorial Board. There is no author-reply section.

Scope of Review

The manuscript asks at which site, if any, Article 40's axioms have a model inside a dividing vessel. The central observation — that π-stacking supplies the fibre wherever chrysene stacks while the base requires covalent connectors in two planar directions, so that one phase can have either but only the interior lattice has both — survives both reviews. The same-model pass identified two major items: the box restriction in the minimisation and the third conclusion of Theorem 4.1. The independent-model review confirms five principal results after revision and recommends acceptance with minor technical and typographical corrections.

Compiled disposition

Accept with minor revisions. The first-round required revisions (box restriction defended by citation to Article 78, third conclusion of Theorem 4.1 withdrawn, hypothesis marks and assumptions clarified) were incorporated. The independent-model referee confirms the principal results and recommends acceptance after synchronisation of the verification-block register, restoration of a missing multiplication symbol, correction of section cross-references, and clearance of typographical items. No further computation is required. The completeness minima, the Minkowski-sum containment, and the genome threshold stand.

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1 Stage summary of the first report

R1 — Theorem 5.1 minimises over boxes only

[**MAJOR**] Definition 3.2 defines completeness over arbitrary finite subsets of $\mathbb{Z}^3$. Theorem 5.1 then minimises only over occupied boxes and reports 27. Over arbitrary finite sub-lattices the minimum is 7 (a site with its six neighbours); the heritable minimum under midplane cleavage is 14. The restriction is never defended. Most of Section 8's obligations on the rest of the corpus are artifacts of it. Remedy: cite Article 78's Definition 5.2 as the warrant for the box restriction, restate Theorem 5.1 as a minimum over box configurations, and record the unrestricted minima in a remark.

R2 — Theorem 4.1's third conclusion

[**MAJOR**] The theorem concludes that in a vessel with no interior lattice, axioms A_7–A_9 have no model. Article 40's Remark 12 states that the quasi-local algebra records bounded operations on local degrees of freedom and is not built by quotienting by the contraction relations. The first two conclusions stand; the third does not follow as argued. Remedy: withdraw the third conclusion. The abstract and conclusion must be revised in step.

R3–R7 and minor items

R3: Hypothesis 3.4's corpus support is an inference presented as a citation; downgrade the mark. R4: Proposition 3.3 carries a chemical assumption in a counting statement; promote it to a named hypothesis. R5: The strand row of Table 1 is asserted, not derived. R6: Section 8's obligations are contingent on R1. R7: The abstract overstates what Theorem 4.1 delivers. Minor: Corollary 7.3's scope, Proposition 6.2's novelty, Remark 6.4's withdrawal, Table 1's bilayer row, Target 10.2, notation. Sound findings: Proposition 3.3 identities correct; Theorem 5.1 correct as stated over boxes; Proposition 6.2 and Theorem 6.3 correct. The complementarity argument survives.

2 Stage summary of the independent-model report

Five principal results confirmed

(i) Site-level realisation predicate and necessity of the interior lattice (Theorem 4.1). (ii) Completeness minima and determination of $\kappa_{\mathrm{ICL}} \geq 1$ (Theorem 5.1, Corollary 5.3). (iii) Exact Minkowski-sum containment and the genome threshold $L_{\mathrm{crit}} = 222$ bp (Theorem 6.4, Corollary 6.5). (iv) Pool reconciliation and material affordability (Proposition 7.2). (v) K-theoretic non-implication and downstream corpus obligations. Recommendation: Accept with Minor Revisions.

Residual items M1–M4 and minor corrections

M1: Synchronise the verification-block register (W1–W5 vs. W1–W8) between Convention 2.1, the body text, and Appendix A. M2: Restore the missing multiplication symbol in the two-unit radius bound of Corollary 6.5 ($2 \times 9.63 = 19.26$ nm, not 29.63 nm). M3: Correct the mismatched section cross-reference (Section 7 vs. Section 8) in Section 10 and Table 2. M4: Clarify founder draw vs. per-period steady-state draw in Proposition 7.2. Minor: restore unrendered negated Morita symbols, direct-sum, and inequality symbols; clear formula and text typos; restore blank Greek letters and status labels; correct the DOI for Article 77 in the references.

3 Full first report (same-model consistency pass, verbatim)

The following is the complete text of the first referee report.

> **Reviewer disclosure.** This report is not independent, and the limitation is material. The review was produced by the same model instance that drafted the manuscript under review, in the same session. The journal's stated methodology exists specifically to prevent this. The report should be read as an author-side consistency pass of unusual depth, not as an editorial review. Two classes of finding are least affected (arithmetic and citation checks) and one is most affected (judgements about hypotheses and framing). Recommendation to the editor: obtain at least one independent model pass before accepting, directed in particular at Sections 1.3, 4 and 8.
>
> ### Summary and recommendation
>
> **Recommendation: major revision.** The manuscript asks a question the corpus had not asked — at which site, if any, do Article 40's axioms have a model inside a dividing vessel — and the question is well posed, the apparatus is appropriate, and the central mechanism is correct and illuminating. The observation that π-stacking supplies the fibre wherever chrysene stacks while the base requires covalent connectors in two planar directions, so that one phase can have either but only the interior lattice has both, is a genuine structural insight and survives this review intact.
>
> Two findings require major revision. R1 shows that Theorem 5.1's minimisation is over boxes only, and that relaxing to arbitrary finite sub-lattices of $\mathbb{Z}^3$ reduces the minimum from 27 nodes to 7 and the heritable minimum from 54 to 14. The restriction is never defended. Most of Section 8's obligations on the rest of the corpus are artifacts of it. R2 shows that the final clause of Theorem 4.1 — that axioms A_7–A_9 have no model in a vessel without an interior lattice — is contradicted by Article 40's Remark 12. The theorem's first two conclusions stand; the third does not follow as argued.
>
> Both have clear remedies and neither is fatal. R1 is repaired by citing Article 78's Definition 5.2, which defines a lattice unit as a box, and restating the result as a minimum over the configurations the corpus admits. R2 is repaired by withdrawing the third conclusion and keeping the first two. The genome threshold of Theorem 6.3 and the containment geometry of Proposition 6.2 are correct and survive both findings, because they depend on the lattice's bounding box, which is unchanged by R1.
>
> ### Required revisions
>
> - **R1.** Theorem 5.1 minimises over boxes, and the restriction is undefended and consequential. Over arbitrary finite sub-lattices the minimum is 7. Under midplane cleavage the heritable minimum is 14. Remark 5.3 is reversed; Section 8's first obligation evaporates; Corollary 5.2 loses most of its force. Remedy: cite Article 78's Definition 5.2 at Definition 3.1 as the warrant for the restriction, restate Theorem 5.1 as a minimum over box configurations, and record the unrestricted minima in a remark.

- **R2.** Theorem 4.1's third conclusion is contradicted by Article 40's Remark 12. The quasi-local algebra records bounded operations on local degrees of freedom and is not built by quotienting by the contraction relations. Remedy: withdraw the third conclusion. The first two are correct and are what the rest of the paper uses. The abstract and conclusion must be revised in step.
- **R3.** Hypothesis 3.4's corpus support is an inference presented as a citation. Downgrade the second paragraph from [C] to [D] and state the inference as an inference.
- **R4.** Proposition 3.3 carries a chemical assumption in a counting statement. Promote it to a named hypothesis and add a target asking whether full lateral bridging is achievable.
- **R5.** The strand row of Table 1 is asserted, not derived. Either derive the $1 \times 1 \times n$ reading from the tether geometry or restate the row as extent ≤ 2.
- **R6.** Section 8's obligations are contingent on R1 and should say so. After R1 is settled, revise Section 8 to state which obligations follow from the box-restricted result and which would follow in any case.
- **R7.** The abstract overstates what Theorem 4.1 delivers. Revise in step with R1 and R2.

Minor revisions

Corollary 7.3's scope (add the condition in the conclusion). Proposition 6.2's novelty (present as a lemma). Remark 6.4's withdrawal (state that the withdrawn claim appeared only in draft). Table 1's bilayer row (footnote distinguishing extent-3D from contraction-complete). Target 10.2 (confirm no other entries superseded). Notation ($\iota(n)$ introduced before use).

Stage reports

Mathematical: Proposition 3.3 identities correct; Theorem 5.1 correct as stated over boxes; Proposition 6.2 and Theorem 6.3 correct. Theorem 4.1 fails at its third conclusion and carries an undefended restriction. Concordance: citations to Article 40 checked; Remark 12 cited accurately for what the paper uses it for and inaccurately overlooked for what it also says. Chemistry: the hypothesis that a connector is a bond is reasonable; its corpus support is weaker than marked. Verification: the script exits zero; the minimisation does not reproduce when the box restriction is lifted. Meta-review: the central insight survives. Both major findings are failures to test a convenient assumption. On satisfactory treatment of R1 and R2, with R3 through R7 addressed, the paper should be accepted.

4 Full independent-model referee report (verbatim)

The following is the complete text of the independent-model referee report.

Manuscript ID: ACF-2026-080 (Vol. 1, No. 4, pp. 1639–1651)
Title: *The Completeness Condition: Realisation of the Twelve-Axiom Framework at a*

Site of the Interior Chrysene Lattice, and the Genome Length It Requires
Author: Charles D. Schaper, Ph.D.
Recommendation: Accept with Minor Revisions

1. Summary and Overall Assessment

This manuscript addresses a foundational question linking the twelve-axiom mathematical architecture of Article 40 to the physical protocell cycle of Articles 62–79: at which site of a dividing vessel, if any, do all tensor contractions of Article 40, Definition 19 simultaneously take values? While Article 78 showed that the membrane-anchored strand retains only the one-dimensional fibre corner and introduced the Interior Chrysene Lattice to restore a three-dimensional representation, it defined 3D viability by coordinate extent rather than by whether any site inside the lattice has all six required neighbours bridged and stacked.

The paper establishes five crisp results, backed by exact rational and geometric verification blocks:

1. **Site-Level Realisation Predicate and Necessity of the Interior Lattice (Sections 3–4).** Under saturated lateral bridging, Proposition 3.4 gives the exact site counts. Theorem 4.1 proves that a site realises all contractions only if $n_x, n_y, n_z \geq 3$ with covalent linkers to all four lateral neighbours. Auditing every phase of the arc proves that outside an ICL of extent at least 3 in each direction, the base–fibre decomposition is realised at no site of the vessel.
2. **The Completeness Minima and Determination of $\kappa_{\mathrm{ICL}} \geq 1$ (Section 5).** Theorem 5.1 proves that over occupied boxes the minimum is 27 (attained uniquely at $3 \times 3 \times 3$) and the minimal heritable Type A box is $3 \times 3 \times 6 = 54$ nodes. Corollary 5.3 observes that $3 \times 3 \times 3$ is precisely the configuration Article 78 tabulated as $\kappa_{\mathrm{ICL}} = 1$. Remark 5.2 compares the unrestricted subset minima against boxes.
3. **Exact Minkowski-Sum Containment and the Genome Threshold $L_{\mathrm{crit}} = 222$ bp (Section 6).** Proposition 6.1 proves the exact circumradius. Theorem 6.4 proves without any free packing parameter that a single complete $3 \times 3 \times 3$ unit requires $L \geq 219$ bp and a heritable $3 \times 3 \times 6$ Type A unit requires $L \geq 222$ bp. Corollary 6.5 shows that housing two complete $3 \times 3 \times 3$ Type B units suffices from $L \geq 637$ bp.
4. **Pool Reconciliation and Material Affordability (Section 7).** Ruling 7.1 resolves the apparent discrepancy between Article 65's pool and Article 78's pool. Proposition 7.2 proves that the 54-node lattice represents only 0.128% of the pool at $\alpha = 0.10$, confirming that the lumen-volume threshold is the sole binding constraint.
5. **K-Theoretic Non-Implication and Downstream Corpus Obligations (Sections 8–9).** Under Hypothesis 8.1, Proposition 8.2 and Corollary 8.3 prove that enlarging the lattice never restores Morita equivalence with the infinite crossed product. Section 9 records the resulting updates to Article 77's stock-reservation witness, the manifest stack-height bound, and Article 78's fifth constraint functional.

This is a sharp, disciplined, and self-correcting contribution to the series. I recommend acceptance once the minor technical and typographical items below are addressed.

2. Technical and Structural Comments

- **M1. Synchronising the Verification Block Register.** Convention 2.1 cites W1–W5; the body cites W1–W8. Update Convention 2.1, restore numerical order in Appendix A, and add entries for W7 and W8.
- **M2. Missing Multiplication Symbol in Corollary 6.5.** The bound is printed as $R_{\text{lumen}} \geq 29.63$ nm; it should be $R_{\text{lumen}} \geq 2 \times 9.63 = 19.26$ nm.
- **M3. Mismatched Section Cross-References.** Section 10 and Table 2 refer to the non-implication of Section 7; Non-implications is Section 8. Change Section 7 to Section 8 in both places.
- **M4. Clarifying Founder Draw vs. Per-Period Steady-State Draw in Proposition 7.2.** Add a parenthetical note that 54 nodes prices the entire unit against a single period's pool, so the steady-state per-period replenishment of 27 nodes is half of those percentages.

3. Minor and Typographical Corrections

Unrendered negated Morita symbols, direct-sum, and inequality symbols appear in Section 1.2, Notation 2.2, Corollary 8.3, Remark 6.2, and Corollary 6.5. Formula and text typos appear in the Abstract, Notation 2.2, Definition 3.1, Proposition 3.4, Proposition 3.6, Theorem 5.1, Corollary 5.3, Proposition 6.1, the conclusion, and Appendix B. Blank Greek letters and status labels appear throughout. The DOI listed for Article 77 in the references is the DOI of Article 75; update it.

Recommendation

Accept with minor revisions. Synchronise the verification-block register, restore the missing multiplication symbol, correct the section cross-references, clarify the founder versus steady-state draw, and clear the typographical items. No further computation is required. The completeness minima, the Minkowski-sum containment, and the genome threshold stand.

References

[Art79] C. D. Schaper. The source. *Annals of the Chrysene Formalism* 1(4):1616–1638, 2026. Article 79.

Revision history

Version	Date	Notes
v1.0	2026-10-28	Review record published with Article 80.

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