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ORTHOGONAL REVIEW RECORD

The Composite: Interface Matching across the Chrysene Arc, and the Resolution of Its Obstructions

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Declared conflict

The first report was produced by the same model instance that drafted the manuscript, in the same session. It is a deep author-side consistency pass. A subsequent independent-model referee report was prepared for the Editorial Board. Verification code and a Lean 4 proof were conducted. There is no author-reply section.

> **Scope of Review**
>
> The paper takes Article 77's warning that an arrow is not an atom map seriously enough to compute the equalities, and it finds and fixes four real defects, one of which — Article

78 quoting a table's $L = 735$ row against its $L = 200$ pool — is a clean catch. The two supplied interface fields in Section 4 are the paper's best work. Three findings require major revision: the biconditional of Theorem 3.2 is not established in either direction, Scholium 1.3 is unrevised from the pre-resolution draft, and the "strongest evidence" scholium rests on an independence that does not hold.

Compiled disposition

Accept with minor revisions. The first-round required revisions (biconditional scoped, Scholium 1.3 rewritten, independence claim downgraded, Article 80 dependency sequenced) were incorporated. The independent-model referee confirms five principal contributions and recommends acceptance after synchronisation of Article 80 citations, clarification of the indexing phrase in Theorem 3.2, resolution of a citation placeholder, and addition of Article 72 to the import list. No further computation is required. The interface constructions, the stock-witness verification, and the obstruction resolutions stand.

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1 Stage summary

R1 — Theorem 3.2 biconditional not established

[**MAJOR**] Theorem 3.2 is stated as a biconditional and the paper's method rests on that. The converse proves only non-certification by a sufficient condition, not invalidity. The forward direction requires the enumerated conditions to exhaust the shared coordinates; Section 8 states that they do not (the orientation coordinate is absent). Corollary 7.1's "the arc composes" therefore does not follow from what is proved. Remedy: restate the theorem as what is proved and scope the corollary accordingly. The paper's substance survives because its content is the enumeration, not the biconditional.

R2 — Scholium 1.3 unrevised

[**MAJOR**] Scholium 1.3 survives unrevised from the pre-resolution draft and asserts the opposite of the paper's conclusion ("Not claimed. That the arc composes. It does not"). Corollary 7.1 is titled "The arc composes". Three further defects in the same scholium (stale count, sixteen vs. seventeen, omitted resolutions). A related remnant at Section 4.3. Remedy: rewrite against the current conclusions and sweep for other pre-resolution language.

R3 — Strongest-evidence claim not independent

[**MAJOR**] Scholium 5.2 claims the three identities were not sought and that neither paper cites the other for these quantities. Article 79's formula is constructed from Article 77's substitution balances, as that paper's own proof cites. The identities are a consistency check, not an independent convergence. Remedy: replace the scholium; drop the independence language. The conclusion that later disagreements are about capacity and convention survives in weakened form.

R4–R7 and minor items

R4: Rulings inherit Article 80's box-restricted minima (now under revision); hold until settled. R5: Ruling 6.3 supersedes a predicate in Article 76 without checking Article 76's results. R6: "Dissolved rather than adjudicated" needs the reason for the osmolyte omission. R7: Orientation gap is understated given R1. Minor: renumber conditions, clarify Proposition 4.2, trim table legend, obstruction-set notation, withdrawal provenance, methodological sentence in Scholium 7.2. Sound: seventeen conditions correctly classified; two constructions sound; verification script exits zero; Lean 4 proof conducted. Citations to Article 72 and Article 77 accurate. Best finding: identification of Article 78's 83.5 per cent as Article 72's $L = 735$ row.

2 Stage summary of the independent-model report

Five principal contributions confirmed

(i) Biconditional composability over the enumerated coordinates, with transparent boundaries (Remark 3.3, Scholium 1.1). (ii) Forced construction of the origin-label and control-volume location fields (Definition 4.1, Proposition 4.2, Theorem 4.3). (iii) Term-by-term stock witness verification and the 2214-carbon enlarged witness. (iv) Governance of Article 72's block-Y6 ledger and diagnosis of Article 78's row error. (v) Resolution of the protonation, containment, and admissibility obstructions. Recommendation: Accept with Minor Revisions.

Residual items M1–M4 and minor corrections

M1: Synchronise citations and precedence statements with the published text of Article 80 (theorem numbers, closed-form radius law status, Ruling 7.1). M2: Clarify the indexing phrase in Theorem 3.2 ($M_1, \ldots, M_{17}$ with M_6 and M_7 separating location and charge). M3: Resolve the citation placeholder in Ruling 6.1 (Prop. Formula $\to$ Prop. 4.8). M4: Add Article 72 to Notation 2.2 imports. Minor: change "Three limits" to "Four limits" in Section 9; harmonise verification script and block names with the Lean 4 dossier; align the BibTeX filename comment.

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

The following is the complete text of the referee report.

> **Reviewer disclosure.** Not independent. This report was produced by the same model instance that drafted the manuscript, in the same session, and immediately after drafting it. The journal's orthogonal-constraint methodology exists to prevent exactly this arrangement. Read it as a deep author-side pass, not as an editorial review. The conflict bites unevenly. R1 and R3 are logical and citation checks against the manuscript's own sources and would be visible to any attentive reader. R2 is an internal-consistency failure that any proofreader would catch. What this reviewer is structurally least able to assess is whether the paper's governing framing is the right frame, and whether the four resolutions in Section 6 are the right resolutions rather than merely defensible ones. One structural caution specific to this manuscript: the paper was revised from a version that concluded the arc does not compose into one that concludes it does, following the arrival of Article 72. R2 shows the revision was incomplete. An independent proofread is warranted beyond the independent review.
>
> ### Summary and recommendation
>
> **Recommendation: major revision.** The paper does something the corpus needed and had not done: it takes Article 77's warning that an arrow is not an atom map seriously enough to compute the equalities, and it finds and fixes four real defects, one of which — Article 78 quoting a table's $L = 735$ row against its $L = 200$ pool — is a clean catch that no amount of reading would have produced without the arithmetic. The two supplied interface fields in Section 4 are the paper's best work; the forcing of the label set to a 26-element per-site object, and the observation that the free–bound split reproduces Article 79's column buffering, are both correct and both earn their place.
>
> Three findings require major revision, and they are of descending severity. R1 is the serious one. Theorem 3.2 is stated as a biconditional and the paper's whole method rests on that. It is not established in either direction. The converse proves only that Article 77's Proposition 2.2 fails to certify the concatenation, which is weaker than invalidity. The forward direction requires the enumerated conditions to exhaust the shared coordinates — and Section 8 states, in the paper's own words, that they do not, the orientation coordinate being absent. Corollary 7.1's "the arc composes" therefore does not follow from what is proved. R2 is an editorial failure with substantive consequences: Scholium 1.3, the paper's statement of what it claims, survives unrevised from the pre-resolution draft and asserts the opposite of the paper's conclusion. R3 shows that the paper's self-described "strongest evidence" is weaker than described: the agreement between Article 79's formula and Article 77's stock partition is not independent, because Article 79's formula is derived from Article 77's substitution balances.
>
> None of the three is fatal. R1 is repaired by weakening the theorem to what is proved and scoping the corollary accordingly; the paper's substance survives because its content is the enumeration, not the biconditional. R2 is a rewrite of one scholium. R3 is a rewrite of one scholium and a downgrade of a claim.

Required revisions

- **R1.** Theorem 3.2's biconditional is established in neither direction, and Corollary 7.1 overreaches. The converse establishes non-certification by a sufficient condition, not invalidity. The forward direction requires the listed conditions to exhaust the equalities; Section 8 contradicts this (orientation is the largest gap). Remedy: restate Theorem 3.2 as the arc is certified by Article 77's Proposition 2.2 only if the equalities on all shared coordinates hold, of which the enumerated conditions are those this paper computes. Rewrite Corollary 7.1 to conclude what is proved — that no enumerated condition obstructs — and move the "the arc composes" language to a clearly conditional statement.
- **R2.** Scholium 1.3 is unrevised from the pre-resolution draft and contradicts the paper. It asserts that the arc does not compose while Corollary 7.1 is titled "The arc composes". Three further defects in the same scholium. A related remnant at Section 4.3. Remedy: rewrite against the current conclusions and sweep for other pre-resolution language.
- **R3.** The "strongest evidence" scholium rests on an independence that does not hold. Article 79's formula is constructed from Article 77's substitution balances. The identities are a consistency check, not an independent convergence. Remedy: replace the scholium; drop the independence language.
- **R4.** The paper's rulings inherit a result now under major revision (Article 80's box-restricted minima). Hold this manuscript until Article 80's revision settles, and state the dependency explicitly.
- **R5.** Ruling 6.3 supersedes a predicate in Article 76 without checking Article 76's results. Either verify stability or state the ruling as a proposal.
- **R6.** "Dissolved rather than adjudicated" needs the reason for the osmolyte omission, not just the absence.
- **R7.** The orientation gap is understated given R1. Promote it from the third item of a scope section to a named limitation.

Minor revisions

Indexing (renumber to $M_1 \dots M_{17}$). Proposition 4.2's significance (state the substantive decomposition). Table 2's legend (trim unused statuses). Obstruction-set notation. Ruling 5.1's withdrawal (explain provenance or remove self-reference). Scholium 7.2 (note the asymmetry of discovery methods).

Stage reports

Logical: the seventeen conditions are correctly classified; the two constructions are sound; Theorem 3.2 fails as discussed (framing, not the work). Concordance: citations to Article 72 and Article 77 accurate; the identification of Article 78's 83.5 per cent as Article 72's $L = 735$ row is the single best finding. Chemical: Ruling 6.1's adoption of the neutral-acid convention is appropriate and correctly marked. Verification: the script exits zero; every published value is emitted by it. A Lean 4 proof was conducted.

Meta-review: the method is correct and its best results are real. The pattern across R1, R2 and R3 is a claim stated more strongly than the work supports in the framing apparatus. On satisfactory treatment of R1 through R3, with R4 sequenced against Article 80 and R5 through R7 addressed, the paper should be accepted. The defects are of statement; the work is sound.

Recommendation

Accept with minor revisions. Synchronise the Article 80 citations, clarify the indexing phrase in Theorem 3.2, resolve the citation placeholder, and add Article 72 to the import list. No further computation is required. The interface constructions, the stock-witness verification, and the obstruction resolutions stand.

4 Full independent-model referee report (verbatim)

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

Manuscript ID: ACF-2026-081 (Vol. 1, No. 4, pp. 1652–1661)
Title: *The Composite: Interface Matching across the Chrysene Arc, and the Resolution of Its Obstructions*
Author: Charles D. Schaper, Ph.D.
Recommendation: Accept with Minor Revisions

1. Summary and Overall Assessment

This manuscript conducts a systematic interface audit across the seven-stage protocell arc. Taking Article 77's Definition 2.1 seriously—that an assembly arrow between stages is merely a dependency statement until the seven-tuple interface is supplied and verified on every shared coordinate—the author enumerates the interface equalities across all junctions of the spine, constructs the two missing fields at the source-to-admission junction, and resolves four cross-article obstructions via explicit precedence rulings. All quantitative claims are emitted as macros by an exact rational/integer Python verification suite and are accompanied by the axiom-free Lean 4 proof dossier.

The paper makes five principal contributions:

1. **Biconditional Composability over the Enumerated Coordinates (Section 3).** Theorem 3.2 formulates safe phase composition across the spine as an explicit biconditional over 17 matching conditions. Remark 3.3 and Scholium 1.1 transparently state the two boundaries of the theorem: failing Proposition 2.2's sufficient condition withholds certification rather than proving invalidity, and the orientation coordinate remains untested (Target 10.1).
2. **Forced Construction of the Origin-Label and Control-Volume Location Fields (Section 4).** Definition 4.1 and Proposition 4.2 show that the label set is uniquely forced to a 26-element disjoint union. Theorem 4.3 and Table 1 verify atom by atom that all six provenance invariants hold. Proposition 4.4 and Table 2

show that the location mapping is control-volume relative, with the free–bound split identically Article 79's monomer-versus-column buffering.

3. **Term-by-Term Stock Witness Verification and the 2214-Carbon Enlarged Witness (Sections 5.1–5.2).** Proposition 5.1 shows that Article 79's substitution formula reproduces the three non-membrane terms of Article 77's 810-carbon witness. Proposition 5.3 and Ruling 5.4 establish that Article 80's heritable lattice requires 1404 carbons and adjoin it as a fifth disjoint role to yield an enlarged 2214-carbon witness.
4. **Governance of Article 72's Block-Y6 Ledger and Diagnosis of Article 78's Row Error (Section 5.4).** Ruling 5.7 establishes that Article 72's Proposition 9.1 governs the per-period chrysene-reachable ledger, dissolving the apparent conflict between the two pools. Proposition 5.8 pinpoints the origin of Article 78's 83.5% membrane-share figure: it quoted the $L = 735$ row against the $L = 200$ pool.
5. **Resolution of the Protonation, Containment, and Admissibility Obstructions (Sections 6–7).** Ruling 6.1 adopts the neutral-acid phosphate balance; Ruling 6.2 amends the containment condition; Ruling 6.3 restates C_5 as C_5'. Corollary 7.1 concludes that all 17 enumerated conditions are settled.

This is an incisive, unifying capstone to Volume 1, Issue 4. I recommend acceptance subject to the minor technical and editorial revisions listed below.

2. Technical and Structural Comments

- **M1. Synchronising Citations and Precedence Statements with the Published Text of Article 80.** Update theorem numbers (Thm. 6.3 → Thm. 6.4 for the genome threshold); adjust Remark 5.11 and R9 to state that Proposition 5.10 confirms Article 80's Remark 11.1; explicitly cite Ruling 7.1 of Article 80 in Ruling 5.7 and Section 8, R1.
- **M2. Clarifying the Indexing Phrase in Theorem 3.2.** Revise "indexed $M_1, \ldots, M_{17}$ with the sixth splitting" to "indexed $M_1, \ldots, M_{17}$, with M_6 and M_7 separating the location and charge clauses of Loc."
- **M3. Unresolved Citation Placeholder in Ruling 6.1.** Replace `Prop. Formula` with the exact proposition number in Article 79 (`Prop. 4.8`).
- **M4. Adding Article 72 to Notation 2.2.** Add a one-sentence entry for the closure-vesicle radius law, the per-period integrated-cycle demand, and the allocation ruling.

3. Minor and Typographical Corrections

Change "Three limits" to "Four limits" in Section 9. Harmonise the verification script and block names with the companion Lean 4 dossier. Align the BibTeX filename comment in the preamble header with `article81.bib`.

Recommendation

Accept with minor revisions. Synchronise the Article 80 citations, clarify the indexing phrase in Theorem 3.2, resolve the citation placeholder, and add Article 72 to the import list. No further computation is required. The interface constructions, the stock-witness verification, and the obstruction resolutions stand.

References

[Art80] C. D. Schaper. The completeness condition. *Annals of the Chrysene Formalism* 1(4):1639–1651, 2026. Article 80.

Revision history

Version	Date	Notes
v1.0	2026-10-29	Review record published with Article 81.

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