

LEVEL-1 INTERNAL-CONSISTENCY REVIEW RECORD
*AI-Augmented Peer Review by Orthogonal Constraint:
A Retrospective Case Study of Mathematical,
Concordance, Chemical, and Meta-Review*

Compiled by the Editorial Office

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REVIEW SCOPE AND OBJECTIVE

This record is a Level-1 internal-consistency review of Article 41. The paper is a retrospective process study of the multi-pass review of Article 40 (*The Chrysene Formalism Revisited*). The present review asks only:

- (1) whether the paper’s account of that review is accurate against the Article 40 review corpus;
- (2) whether the coded ledger, tables, figures, and prose are internally consistent;
- (3) whether limitations, supplements, and claims about what the case does *not* show are stated at the same strength as the results.

It does not re-prove the twelve axioms, re-run chemistry, or re-score concordance.

Scope of Review

Level-1 review of a process paper tests portrait accuracy and arithmetic/claim hygiene. It is not a second mathematics review of the twelve-axiom foundation. The controlling comparison objects are the Article 40 review reports (iterative 68 $\rightarrow$ 92 reconstruction; standalone mathematics 81/88/84/100; chemistry 94 and 90; concordance audits; targeted verification; meta-reviews 98 and 93).

DISCLOSURE OF AI USE

The author claims the use of AI in the development of the underlying Article 40 manuscript and of the review architecture studied here. This Level-1 review was prepared independently against that published review corpus.

ORTHOGONAL REVIEW PROCEDURE

Review workflow: This review is confined to internal consistency and to whether the process paper is an accurate portrait of the Article 40 multi-pass review. It does not re-score the twelve-axiom mathematics, chemistry, or concordance of Article 40. No author-reply section is included.

Compiled publication disposition

Accept with Minor Revisions.

The process paper is an accurate portrait of the Article 40 review at the level of architecture, pivotal events, score triad 81/88/100, targeted-verification items, concordance reconstruction principle, chemistry defects, and meta-review rule (final manuscript controlling; scores not averaged). Tables 1–3 are arithmetically consistent. Remaining issues are scope statements about omitted review files, equation-number reuse, and inspectability of the claimed S1–S10 archive from the PDF alone.

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1. STANDALONE LEVEL-1 REVIEW

Level-1 internal consistency and portrait accuracy

Recommendation. Accept with minor revisions.

Score. 90/100.

Confidence. 5/5 on portrait checks that can be performed against the Article 40 reports; 3/5 on ledger-cell classifications that live only in the unpublished S8 workbook.

1.1. **Editorial recommendation.** The manuscript does what it claims as a single-case retrospective. It does not overclaim superiority to conventional peer review. The reconstruction of the Article 40 trajectory matches the review files on the points that matter: layered objectives; concordance failure after mathematical improvement; restoration without unsupported implication; chemistry confined to qualification and nomenclature; targeted verification of named repairs; meta-review that refuses to average 81, 88, and 100.

Minor revisions are required so that the portrait is complete rather than selective, and so that equation labels and supplement claims do not outrun what the PDF itself exhibits.

1.2. **Ten-category scoring.**

Category	/10	Note
Accuracy of Article 40 review architecture	10	M / C / H split, sequence (3), criticism $\neq$ revision $\neq$ verification.
Accuracy of the mathematics-track portrait	8	81/88/100 and the listed defects are correct; the 84/100 independent review and the 68 $\rightarrow$ 92 seven-round report are under-specified in the triad.
Accuracy of concordance portrait	10	Failed-then-restored concordance; restore-structure-not-implication; human editorial role.
Accuracy of chemistry portrait	10	Bay/K-region, $\mathcal{B}_4$ as combinatorial class, Appendix B as witness.
Accuracy of verification and meta-review portrait	9	Targeted items match; two meta-reviews exist (98, 93) while some sentences say “the meta-review.”
Internal arithmetic of Tables 1–3 and Figure 1	10	All displayed totals and percentages recompute.
Consistency of methods with results	9	Coding rules match the tables; P1 “no explicit verification” is explained.
Limitations and non-claim hygiene	10	Single case, retrospective coding, no control group, no blinded raters, author-as-editor, no autonomous-AI claim.
Supplement / provenance inspectability	7	S1–S10 are specified; the PDF does not itself contain the ledger cells.
Exposition and internal cross-reference	7	Refrain equations are reused under new numbers; (4) reappears as (36).
Total	90	

1.3. **What the Article 40 corpus actually contains.** The comparison set used for this review is:

- iterative reconstruction report, seven scored rounds, 68/100 reject $\rightarrow$ 92/100 accept;
- independent standalone review 84/100, minor revision (5 September);
- standalone mathematics 81/100, major revisions (labeled uniqueness, $C_{2h} \cong$ versus $O(3)$ -conjugacy);
- standalone mathematics 88/100, accept with minor revisions (6 September);
- standalone mathematics 100/100, accept;

- chemistry 94/100 and 90/100, both accept with minor revisions, both on bay/K-region;
- concordance audit of Table 1 / Section 8;
- five-restorations / four-rejected-implications audit;
- targeted verification: pass with minor edits; FC discharged; AE discharged;
- meta-reviews 98/100 and 93/100, both accept with minor revisions.

1.4. Portrait checks that pass.

- (1) The operational definition of orthogonal review as distinct validity questions, not geometric orthogonality, matches how the Article 40 tracks were commissioned.
- (2) Equation (1) and $\mathcal{F}_{\text{adm}} = M \cap C \cap H$ correctly describe the Article 40 rule that chemistry success does not repair an invalid theorem and mathematical elegance does not establish chemical realizability.
- (3) Sequence (3) matches the actual order: mathematics $\rightarrow$ concordance failure $\rightarrow$ reconstruction $\rightarrow$ chemistry $\rightarrow$ renewed mathematics $\rightarrow$ targeted verification $\rightarrow$ meta-review, with return arrows.
- (4) The 81/88/100 disagreement, the refusal to average, and the list of strict-review defects ($O(3)$ -conjugacy, graph/node typing, labeled uniqueness, compact resolvent, Schur adjoint, stale FC/AE language) are exactly the 81/100 report.
- (5) Targeted-verification items in §2.6 match the targeted-verification file.
- (6) Concordance principle “restore foundational structure without restoring unsupported implication” is the principle of the five-restorations audit and of the 93/100 meta-review.
- (7) Chemistry confined to identity, locants, C_{2h} achirality, bay versus K-region, $\mathcal{B}_4$ as combinatorial class, and Appendix B as witness: accurate.
- (8) Meta-review rule that the final manuscript is controlling, and that earlier scores are state-dependent, matches both meta-reviews.
- (9) Limitations in §4.6 correctly refuse a superiority claim and record author-as-editor, same-environment AI, retrospective coding, and no control group. The 93/100 meta-review had already flagged the author-as-editor process fact.

1.5. Portrait issues (not blocking).

- MINOR 1.** Section 4.2 presents “the three mathematics assessments” as 81, 88, 100. The corpus also contains 84/100 (5 September independent review) and the 68 $\rightarrow$ 92 iterative cycle. Methods §2.3 correctly distinguish an early developmental cycle from later standalone review. The Discussion triad should either (a) state that 81/88/100 are the later standalone set or (b) footnote 84 and 68 $\rightarrow$ 92 so the portrait is complete.
- MINOR 2.** Two meta-reviews exist (98 and 93). Appendix B.1 S6 correctly uses the plural. Several Discussion and Methods sentences use the singular. Synchronize.
- MINOR 3.** Models used on Article 40 (ChatGPT, Gemini, Grok) are not named. That is not a false statement. For a process paper whose object is AI-augmented review, one

sentence identifying the systems would make the portrait match the Article 40 review record.

MINOR 4. Equation (4) and Equation (36) state the same trichotomy. Equation (2) reappears as (38). The refrain (5)/(11)/(34) is intentional; the recycled numbers are not. Renumber or cite the first occurrence.

MINOR 5. Appendix B asserts an S1–S10 archive as the evidentiary basis for the counts. From the article PDF alone those cells cannot be recomputed. Add a one-line statement that the 63-action classifications live in S8, or print a compact action list as an additional table. Until then the arithmetic of the *aggregates* can be checked and is correct; the assignment of any single action to “major” or “structural restoration” cannot.

1.6. Arithmetic audit of the ledger displays. Recomputed from the printed tables.

Check	Result
22 + 34 + 7 major/minor/editorial	63
20 + 43 structural/local	63
Table 2 stage counts 6 + 9 + 3 + 7 + 27 + 4 + 7	63
Table 2 major 3 + 9 + 0 + 0 + 10 + 0 + 0	22
Table 2 structural 3 + 9 + 0 + 0 + 8 + 0 + 0	20
Table 2 explicit verification 0 + 9 + 3 + 7 + 25 + 4 + 0	48
Table 3 row sums	63
Table 3 column sums 35 + 9 + 8 + 4 + 7	63
22/63 = 34.9%, 20/63 = 31.7%, 59/63 = 93.7%	hold
48/63 = 76.2%, 55/63 = 87.3%, 27/63 = 42.9%	hold
35/63 = 55.6%, 11/35 = 31.4%	hold
P1 structural 3 + P5 structural 8	11 mathematics-structural, matches §3.4
P2 9 all major and structural	matches concordance 9/9
Proof/analytic 9 and theorem/claim 6 all Mathematics	matches the “all coded proof and theorem-streng
Structural restorations 7, all Concordance	matches the text
20 = 11 _{math} + 9 _{conc}	holds
22 major = 13 _{math} + 9 _{conc}	holds
Figure 1 bar heights 6, 9, 3, 7, 27, 4, 7	match Table 2

No arithmetic defect was found in the published aggregates.

1.7. Internal-consistency issues that are not portrait errors.

- P7 has 7 actions and 0 explicit verification, which the table footnote correctly explains (end of recorded process).
- P1 has 0 explicit verification; the footnote correctly says later indirect support or supersession by concordance reconstruction.
- Chemistry total 8 versus P4 count 7 is consistent if one chemistry-coded action sits in another phase (Table 3 allows that).
- One publication-process action outside $N_{\text{man}} = 63$ is used uniformly.

- Definite-recommendation denominator 61 (excluding one optional and one conditional) is used uniformly in (20)–(21) and Table 1.

1.8. What this review does not certify. This review does not certify that the unpublished S8 coding of each of the 63 actions is the unique correct coding. It certifies that the published aggregates are self-consistent and that the narrative of stages, scores, defects, and non-claims matches the Article 40 reports that were compared.

1.9. Exact revision recommendations.

Required Revisions

- (1) In §4.2, qualify the 81/88/100 triad as the later standalone mathematics set, and mention the 84/100 report and the $68 \rightarrow 92$ developmental cycle.
- (2) Use “meta-reviews” wherever both 98/100 and 93/100 documents are in view.
- (3) Name the AI systems used in the Article 40 reviews, or state that system identity is withheld.
- (4) Stop re-numbering the same displayed principle; cite (4) and (2) on later use.
- (5) Point the reader to S8 for action-level coding, or add a one-page action inventory so the 63 counts are inspectable from the article itself.

1.10. Final Level-1 decision.

- (a) Publishable after the listed wording repairs? **Yes.**
- (b) Does any central process claim misrepresent the Article 40 review? **No.**
- (c) Do the published tables contradict themselves? **No.**
- (d) Are further subject-specific rounds of Article 40 mathematics or chemistry warranted because of this paper? **No.**

Level-1 decision

ACCEPT WITH MINOR REVISIONS.

90/100.

The process paper is an accurate, appropriately limited portrait of the Article 40 multi-pass review. The remaining work is completeness of the score inventory, equation-number hygiene, and inspectability of the coded ledger.

FINAL REMARKS FROM THE EDITORIAL REVIEW COMMITTEE CHAIR

Level-1 internal-consistency review of Article 41 is complete. The paper is accepted as a process record of Article 40, not as a comparative trial of AI-augmented versus conventional review.

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REVISION HISTORY

Version	Date	Notes
v1.0	2026-09-30	Initial publication of the Level-1 review record.

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.