ANNALS OF THE CHRYSENE FORMALISM

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

ORTHOGONAL REVIEW RECORD

The Source: Substitution-Initiated Self-Separation of the Substituted-Chrysene Stock from a Polyaromatic Bulk, and the Supply It Delivers to the Protocell

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

Paper ID:	ACF-1.4-079
Issue:	Volume 1, Number 4
ISSN:	3144-2021
Review architecture:	Independent referee report
Review focus:	Substitution-initiated export, design equation, columnar transfer matrix, dynamical scission, supply interface
Acceptance date:	2026-10-26
Online publication:	2026-10-26
Pages:	1616–1638
Document version:	v1.0
Last audited:	26 October 2026

Citation: Schaper, C. D. (2026). The Source: Substitution-Initiated Self-Separation of the Substituted-Chrysene Stock from a Polyaromatic Bulk, and the Supply It Delivers to the Protocell. *Annals of the Chrysene Formalism*, 1(4), 1616–1638. ISSN 3144-2021. `https://chrysene.com/index.php/acf/article/view/79` • © 2026 Charles D. Schaper. Distributed under the CC Attribution-NonCommercial-NoDerivatives 4.0.

Declared conflict

This is an independent referee report prepared for the Editorial Board. There is no author-reply section.

> **Scope of Review**
>
> This manuscript constructs the upstream chemical and dynamical source that supplies the substituted-chrysene stock assumed as a boundary condition in Articles 62, 65, 77, and 78. Rather than postulating an external purification apparatus or relying on the earlier monograph's metric divergence to assert physical separation, the author shows how covalent

arm installation in a hydrophobic polyaromatic bulk, coupled to partition into an adjacent aqueous stock phase and face-to-face columnar stacking, achieves both stoichiometric matching to protocell demand and exponential geometric rejection of non-chrysene competitors. The paper establishes five principal advances, each verified in exact rational or controlled floating-point arithmetic by `verify_source.py`.

Compiled disposition

Accept with minor revisions. The independent referee confirms five principal advances and recommends acceptance after reconciliation of the selectivity-filter count, ordering of verification blocks, restoration of three displayed equations, and synchronization of issue numbers and pagination. No further computation is required. The export distribution, design equation, columnar transfer matrix, and dynamical scission results stand.

Contents

1 Stage summary **3**

2 Full independent referee report (verbatim) **3**

1 Stage summary

Five principal advances confirmed

(i) Substitution-initiated export as an absorbing Markov chain (closed-form exit distribution, off-chain leakage bound, axis-selectivity window, completion identity). (ii) The design equation, material efficiency, and the cooperativity trade-off (matching condition, efficiency bound, kinetic price of matching). (iii) Two-species columnar transfer matrix, arm registry, and the four-filter hierarchy (Perron impurity limit, registry suppression). (iv) Dynamical scission versus counterfactual return relaxation (exponential emptying, nonsingular M-matrix, isolated waste class). (v) Supply interface with Articles 65, 77, and 78 (demand vector, admission predicate, Burnside orbit counts, arm efficiency, carbon ledger, Smoluchowski ceiling).

Major items M1–M4

M1: Reconcile the count of selectivity filters (three vs. four) between Section 1.4, Scholium 8.14, Target 14.6, and Table 1; identify Registry as stage (4). M2: Update Section 1.4 to Blocks V1–V13, restore numerical order of V12 and V13, and note that V6 was retired. M3: Restore the full 5×5 upper bidiagonal generator in Definition 6.2, the impurity bound in Proposition 8.11, and the arm-efficiency formula in Proposition 10.11. M4: Synchronize the banner issue number (No. 5 vs. No. 4) and update provisional page numbers for Articles 62, 65, and 77 to their final ranges.

Minor and typographical corrections

Formula and text typos (citation footer, Definition 4.1 chain symbols, Proposition 5.3 exponent, Theorem 7.2 status label, Corollary 7.4 exponent, Remark 7.8, Proposition 9.8, Definition 10.1, Proposition 10.11, Proposition 10.13, Proposition 10.15, falsification register, Remark 14.13, Block V13, bibliography key). Unrendered Greek symbols and blank status labels throughout.

2 Full independent referee report (verbatim)

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

Manuscript ID: ACF-2026-079 (Vol. 1, No. 4, pp. 1616–1638)
Title: *The Source: Substitution-Initiated Self-Separation of the Substituted-Chrysene Stock from a Polyaromatic Bulk, and the Supply It Delivers to the Protocell*
Author: Charles D. Schaper, Ph.D.
Recommendation: Accept with Minor Revisions

1. Summary and Overall Assessment

This manuscript constructs the upstream chemical and dynamical source that supplies the substituted-chrysene stock assumed as a boundary condition in Articles 62, 65, 77, and 78. Rather than postulating an external purification apparatus or relying on the earlier monograph's metric divergence ($d^*_{\mathfrak{C}} = +\infty$) to assert physical separation, the author shows how covalent arm installation in a hydrophobic polyaromatic bulk β, coupled to partition into an adjacent aqueous stock phase σ and face-to-face columnar stacking in $\kappa \subseteq \sigma$, achieves both stoichiometric matching to protocell demand and exponential geometric rejection of non-chrysene competitors.

The paper establishes five principal advances, each verified in exact rational or controlled floating-point arithmetic by `verify_source.py` (Blocks V1–V13, Appendix B):

1. **Substitution-Initiated Export as an Absorbing Markov Chain (Sections 4–6).** Grounded in Figure 12 of U.S. Patent No. 12,195,423 B1, unsubstituted chrysene in β undergoes sequential electrophilic bromination along the chain $\mathcal{P} : \emptyset \subset \{6\} \subset \{6, 12\} \subset \{3, 6, 12\} \subset \{3, 6, 9, 12\}$, followed by oxalate esterification and reduction to hydroxyethoxy arms. Under group additivity, forward-rate scaling, and no return of armed units, Theorem 6.4 derives the closed-form exit distribution

$$p_n = \frac{e_n}{\lambda_n} \prod_{j=0}^{n-1} \frac{k_{j+1}}{\lambda_j}, \qquad \lambda_n = e_n + k_{n+1},$$

   together with the off-chain leakage bound, the axis-selectivity window, and the completion identity $p_4/p_3 = k_4/e_3$.

2. **The Design Equation, Material Efficiency, and the Cooperativity Trade-Off (Section 7).** Theorem 7.2 proves that the exported $D : T$ ratio matches the protocell demand ratio if and only if $k_3 = e_2(R_T/R_D)(1 + e_3/k_4)$. Theorem 7.3 establishes the material efficiency bound. Proposition 7.5 isolates the exact kinetic price of matching, demonstrating that tolerating a small initiator export reduces the required cooperativity from 18,511 to 18.5.

3. **Two-Species Columnar Transfer Matrix, Arm Registry, and the Four-Filter Hierarchy (Section 8).** Theorem 8.3 proves that the interior impurity fraction in columns of length l converges at rate $O(1/l)$ to the Perron limit. Combining Article 40's enumeration of the seven four-ring polyhexes with the arm-registry factorisation, Corollary 8.6 and Proposition 8.11 prove that a non-registering guest is suppressed by $e^{-2\nu\Delta_{\mathrm{rgy}}}$. Selective bulk arming becomes optional.

4. **Dynamical Scission vs. Counterfactual Return Relaxation (Section 9).** Theorem 9.4 and Corollary 9.5 prove that under the stated hypotheses the bulk empties exponentially, the admissible stock retains weight 0.998901, and the low-degree exports form a dynamically isolated waste class. Conversely, if return is permitted, all states of degree $n < 4$ become transient.

5. **Supply Interface with Articles 65, 77, and 78 (Section 10).** Section 10 consolidates the per-period demand vector, proves that Article 77's admission predicate admits every degree-≥ 2 export, counts the ι-orbits of arm words via Burnside's lemma, evaluates arm efficiency under partial ester cleavage, closes the upstream carbon ledger, and derives the Smoluchowski diffusion ceiling.

The manuscript is exceptionally well-structured, self-critical, and mathematically rigorous. I recommend acceptance after the author addresses a few minor consistency, formatting, and typographical items detailed below.

2. Technical and Structural Comments

- **M1. Reconciling the Count of Selectivity Filters (three vs. four).** Scholium 8.14, Section 11, and Proposition 14.12(vi) analyze selectivity as four sequential filters. Section 1.4, Target 14.6, and Table 1 row H_{rgy} still retain the earlier three-filter numbering. Update them so they consistently refer to the four filters and identify Registry as stage (4).
- **M2. Ordering and Numbering of Verification Blocks V1–V13.** Section 1.4 lists Blocks V1–V12, omitting V13. In Appendix B, V6 is absent and V13 is printed above V12. Update Section 1.4 to V1–V13, restore numerical order, and note that V6 was retired.
- **M3. Formatting of Displayed Equations.** Restore the full 5×5 upper bidiagonal generator G in Definition 6.2; restore the impurity bound in Proposition 8.11; restore the arm-efficiency formula $\eta_{\mathrm{arm}} = (R_D + R_T)/(R_D/(1-\pi_h^2) + R_T/\pi_e^4)$ in Proposition 10.11.
- **M4. Synchronizing Issue Numbers and Provisional Pagination.** The top banner on p. 1616 reads No. 5; the citation footer and running headers read No. 4. Update provisional page numbers for Articles 62, 65, and 77 to their final ranges.

3. Minor and Typographical Corrections

Formula and text typos appear in the citation footer, Definition 4.1, Proposition 5.3, Theorem 7.2, Corollary 7.4, Remark 7.8, Proposition 9.8, Definition 10.1, Proposition 10.11, Proposition 10.13, Proposition 10.15, the falsification register, Remark 14.13, Block V13, and the bibliography key. Unrendered Greek symbols ($\beta, \sigma, \kappa, \Phi, \iota, \pi, \lambda_*$) and blank status labels appear throughout.

Recommendation

Accept with minor revisions. Reconcile the selectivity-filter count, restore the verification-block ordering, restore the three displayed equations, and synchronize the issue numbers and pagination. No further computation is required. The export distribution, design equation, columnar transfer matrix, and dynamical scission results stand.

References

[Art78] C. D. Schaper. The interior chrysene lattice. *Annals of the Chrysene Formalism* 1(4):1606–1615, 2026. Article 78.

Revision history

Version	Date	Notes
v1.0	2026-10-26	Review record published with Article 79.

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.