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| Book Name: | [Chemistry and Biochemistry: Research Progress](https://www.bookpi.org/bookstore/product/chemistry-and-biochemistry-research-progress-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_5922** |
| Title of the Manuscript: | **Marcus Cross-Relationship Probed by Time-Resolved CIDNP** |
| Type of the Article | **Book Chapter** |

**Special note:**

**A research paper already published in a journal can be published as a Book Chapter in an expanded form with proper copyright approval.**

**Source Article:**

**This chapter is an extended version of the article published by the same author(s) in the following journal.**

**Journal of International Journal of Molecular Sciences, 24: 13860, 2023.**

**DOI:** [**https://doi.org/10.3390/ijms241813860**](https://doi.org/10.3390/ijms241813860)

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| PART 1: Comments | | |
|  | Reviewer’s comment **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | **I note that the manuscript deals with a very specialized field - DEE which involves short-lived radicals - using CIDNP spectroscopy, which is a particularly suitable method but is rarely applied.** |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **"Experimental Validation of Marcus Cross-Relations Using Time-Resolved CIDNP Spectroscopy"** |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | **No but I put a phrase *“*This work provides the first systematic application of the Marcus cross-relation with experimentally derived temperature-dependent reorganization energies for short-lived radicals.”** |  |
| **Is the manuscript scientifically, correct? Please write here.** | **Yes correct** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | **Yes but I suggest more recent studies** |  |
| Is the language/English quality of the article suitable for scholarly communications? | My opinion it’s a suitable |  |
| Optional/General comments | **Weaknesses and Concerns**   1. **Insufficient Discussion of Discrepancies** The discrepancy between experimental and calculated rate constants (e.g., a two-orders-of-magnitude difference in the GMP(-H)•/TyrO− case) is acknowledged but not sufficiently explained. The authors should explore possible causes (e.g., solvent reorganization, neglected entropic factors, or secondary reactions). 2. **Excessive Theoretical Density** Certain sections—especially those related to diffusion correction and electrostatic work functions—are presented with dense mathematical formalisms but lack intuitive physical interpretations. This may alienate non-specialist readers. 3. **Limited Contextualization with Recent Literature** Although foundational references are included, the manuscript would benefit from a comparative discussion with more recent studies (past 3–5 years) to highlight its methodological advancement. 4. **Clarity of Presentation** The manuscript would be improved by adding a schematic diagram summarizing the studied radical systems and their interrelated reactions to help readers grasp the overall reaction network.   **Recommendations for Improvement**   * Add a dedicated subsection discussing the causes and implications of large discrepancies between theoretical and experimental rate constants. * Include a visual schematic summarizing the radical pairs, DEE reactions, and CIDNP pathways. * Expand the literature context with relevant citations from the last 3–5 years. * Provide more intuitive commentary on the physical meaning behind the mathematical models, especially Equations (20–24).   **Final Recommendation: Major Revision**  While the study is scientifically valuable and suitable for publication, substantial revision is required to address the analytical discrepancies and to enhance clarity for a broader scientific audience. |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s Feedback** (It is mandatory that authors should write his/her feedback here) |
| **Are there ethical issues in this manuscript?** | *(If yes, Kindly please write down the ethical issues here in details)* |  |

**Reviewer details:**

**Mohammed S.Altaee, Iraq**