

Preface

Retirement Issue Dedicated to Edward L. Clennan

This issue of *Photochemistry and Photobiology* is dedicated to Edward L. Clennan on the occasion of his retirement. It consists of papers from colleagues, friends, and former students.

It is an honor to celebrate Ed Clennan's many contributions to the field of organic photochemistry, physical organic chemistry, and sulfur chemistry. His work has focused on areas with particular interest in advancing a deep understanding of reaction mechanisms.

Ed's approach to experimentation has been strong in fundamentals, including his studies of photooxidation mechanisms in homogeneous and heterogeneous media. One example that stands out was his estimation of the lifetime of singlet oxygen within the interior of zeolites. He also studied photoinduced electron transfer reactions, as well as photocyclizations to reach helicenes, like a spiral staircase. The latter (not *ladder* for a step towards a pun on my part) has potential use in organic electronic devices.

The papers collected in this retirement issue represent a tribute to him. There are twenty two papers covering topics in photochemistry, photosensitization, photoinduced electron transfer, photocatalysis, photobiology, photodynamics, chemiluminescence, photocycloaddition, photoreleasing compounds, helical compounds, fullerenes, and reactive intermediates in micelles and organic capsules.

I thank the authors for their participation in making this a wonderful tribute to Ed. I sensed a high level of enthusiasm by the contributors. This is exemplified by a poem written by Kathleen Edwards and Joel Liebman (Figure 1).

[Figure 1]

It is an honor to celebrate Edward L. Clennan's retirement with this special issue of *Photochemistry and Photobiology*. Thank you, Ed, for all that you have done for us and the field!

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Biography

Edward L. Clennan was born on February 10th, 1951 in St. Paul Minnesota and grew up on a dairy farm near New Richmond Wisconsin. His father was a WWII veteran and a dairy farmer, and his mother was an elementary school teacher and housewife. He had two siblings, a younger brother and a twin brother. His interest in science was evident early on, however, it wasn't focused on chemistry until his first formal exposure to it in high school. He stayed close to his family farm and started his academic career at Wisconsin State College-River Falls as a chemistry major in Fall 1969. In his sophomore year he was introduced to Organic Chemistry by an inspiring

instructor, Dr. James Pavlik, who later moved to Worcester Polytechnic Institute. He began his research career in Dr. Pavlik's laboratory doing photochemistry of pyrylium cations generated from the precursor 2- and 4-pyrones by protonation in 96% sulfuric acid. His first publication was as a coauthor of a *Journal of the American Chemical Society* paper (Pavlik, J. W.; Clennan, E. L. *J. Am. Chem. Soc.* **1973**, 95, 1697-9) describing this research. In 1973 he began his graduate work at the University of Wisconsin-Madison in the group of Professor Stephen F. Nelsen. His graduate research involved a comparison of the dynamic behavior of *tetra*-alkyl hydrazines by variable temperature NMR and by cyclic voltammetry (CV). In 1977 he became a postdoctoral associate in the research group of Professor P. D. Bartlett, a Welch Professor, at Texas Christian University (TCU). This was a unique environment because Professor Bartlett had recently retired from the Harvard Chemistry Department and his group at TCU primarily consisted of postdoctoral associates. During this period of time he had the opportunity to meet many chemists from around the world including Professor Juzo Nakayama from Saitama University in Japan which led to a professional collaboration and a lifelong friendship. In 1979 Ed Clennan took a position as Assistant Professor of Chemistry at the University of Wyoming and was promoted to Full Professor in 1989. He served as Program Officer in the Organic Dynamics Program at the National Science Foundation from 1991 to 1992 and as a member of the American Chemical Society Petroleum Research Foundation Advisory Board from 2013-2018. He was the Chemistry Department Head at the University of Wyoming from July 1, 1996 to June 30th, 1999 and from July 1, 2006 to June 30th, 2012. He is also a member of the Editorial Board for the *Journal of Physical Organic Chemistry* and the Editor of the *Journal of Sulfur Chemistry*.

Over the years he had an excellent group of graduate students, postdoctoral associates, and collaborators from around the world that focused, for most of Ed's career, on singlet oxygen reactions both in homogeneous and heterogeneous medium. The work examining the reactions of

70 singlet oxygen with sulfides resulted in a computational study culminating in the suggestion of a
71 new mechanism for this important reaction that was published in collaboration with Frank Jensen
72 in 1998 (*J. Am. Chem. Soc.* **1998**, *120*, 4439). For the next few years the Clennan group provided
73 experimental evidence to support this new mechanism while also studying the heterogeneous
74 reactions of singlet oxygen in the interior of zeolites. The zeolite work provided the first estimate
75 for the lifetime of singlet oxygen in this heterogeneous media and illustrated the dramatic medium
76 effect on singlet oxygen ene reactions and sulfide photooxygenations. In the latter part of Ed's
77 career, the group went on to study photochemically induced electron transfer (PET) reactions and
78 introduced pyrylogen dicationic PET sensitizers. Most recently his group has been investigating
79 the Mallory photocyclization. The long standing issue of why Mallory photocyclizations have a
80 proclivity to form helicenes rather than more stable photocyclization products was traced to a
81 photostationary-state established between two dihydrophenanthrene intermediates. This key
82 reaction was then used in a Torque-Lock & Propagate approach to make twisted configurationally
83 stable acenes with the goal of making pentacene surrogates for potential use in organic electronic
84 devices.

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88 **FIGURE CAPTION**

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91 **Figure 1.** A photograph of Edward L. Clennan and acrostic poem.
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To Ed Clennan on the occasion of his "official" retirement

Every so often, I think of participating in conferences
Deciding which to attend, now, what are my preferences?
Whom will be there, I recall those also attended by Ed C
And the numerous discussions had between he and me
Researching sulfur and oxygen, thermo- and photo-chemistry
Done with enthusiasm, engagement and high personal energy

Let me describe now our chats, their fulfilled "desiderata"

Chemistry for sure, but there is much else that matter
Lab results, I'm not an "exptalist", Ed never put me on the spot
Energies, sructures, methods, with details I've now forgot
Novelty and concepts Ed shared - I wanted to say "What?!"
Negative results acknowledged, and challenges to what I said
Always educational and enjoyable, my mind well fed
Noteworthy and remembered are my chats with Ed

Kathleen Edwards + Joel Liebman (Maryland), Spring 2021

