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The Tetrahedron Award for Innovation in Organic Chemistry

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Abstract

Two tetrahedron prizes for 1998 have been given out, one to professor Teruaki Mukaiyama of the science university of Tokyo and the other to professor David A. Evans of Harvard University, according to the executive board of editors for tetrahedron publications and Elsevier Science Ltd. These two distinguished organic chemists are renowned for their creative and cutting edge work in organic synthesis, particularly in the field of asymmetric synthesis that employs strategies for the enantioselective formation of new carbon-carbon bonds. This publication includes a special symposium in print that is focused on the general field of "stereoselective carbon-carbon bond forming reaction" as part of honouring the achievements of the tetrahedron prize recipients.

***Keywords:** Tetrahedron; Bonds; Asymmetric synthesis; Stereoselective; Enantioselective*

Introduction

In the modern glacial world, marginal and coastal seas cover less than 10% of the global sea surface, with only a limited number of epeiric seas. Consequently, calcium carbonate production in shallow, restricted marine environments represents a smaller amount of the total production compared with that in open marine settings where primary carbonate producers (e.g. planktic biota) have thrived since the early to middle mesozoic In contrast to the modern world, epeiric seas were far more spatially significant in geological times, particularly during periods of prolonged sea level highstand such as the silurian, devonian and cretaceous, when 20%-50% of the cratonic area was flooded. It served as the main carbonate factory for a significant period of earth's history. With the exception of intracratonic basins, epeiric seas are frequently characterised by the following characteristics: Extremely high surface area to water depth ratios, spatially limited exchange of shallow water masses with the open ocean 'blue' water masses, frequently pronounced seawater evaporation and the absence of water column stratification, (iv) the impact of tidal cycles regularly flooding and emerging vast areas and a very shallow wave base.

Description

However, based on analogies from today, it is most plausible that a network of channel systems was layered over the ancient epeiric seas. Consequently, the idea of a straightforward proximal to distal gradient in the characteristics of seawater oversimplifies the spatially much more complicated organisation of epeiric water masses. For information on paleoclimatology and paleogeochemistry, sedimentologists and stratigraphers have resorted to relict pelagic carbonates preserved in orogenic regions. It has been possible to deduce evidence of time equivalent open ocean climate dynamics, ocean chemistry and the evolution of marine life from sedimentary records of ancient epeiric seas and intracratonic basins. Although several current settings are employed to understand these sedimentary records, few of them can truly serve as analogies for the huge ancient epeiric seas. Additionally, a number of studies have shown that the characteristics of epeiric saltwater may differ greatly from those of 'blue' seawater from open oceans due to their confined nature and continentality. Studying contemporary analogues of historical epeiric seas is important to determine their characteristics and potential differences from contemporary open ocean settings because of the temporal changes of ancient to modern epeiric sea/open ocean ratios and spatial variations e.g. sedimentation, geochemistry between epeiric seas and open oceans and their carbonate archives. Prior research has mostly focused on sediments and their petrologic and geochemical characteristics in subrecent shallow marine carbonate environments. Professors Evans and Mukaiyama briefly discuss some of their professional and personal experiences in the first section of this symposium in print. Their curriculum vitae and lists of their publications are then provided.

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Following an eloquent description of his original synthesis of altohyrtin C by professor Evans, several experts in the field of stereoselective organic synthesis make pertinent contributions. The whole synthesis of natural goods, such as alkaloids and polyene antibiotics, is also discussed. Although synthetic methods for manipulating the stereoselectivity in addition to carbon-carbon and carbon-heteroatom double bonds make up a large section of this special issue, total synthesis of natural products is also included. The variety of these contributions shows that modern synthetic organic chemistry is still very much alive and thriving and there are still many obstacles to be overcome. Not all of the eminent scientists who wished to participate in this special symposium in print were able to due to time constraints. Participants were successful in meeting the deadline with their manuscripts. Additionally, due to the limited space in a single issue of tetrahedron, it was not possible to invite all of the people who have made significant contributions to the field of asymmetric processes that create carbon-carbon.

Conclusion

As a result, the contributions to this symposium in print only serve as an example of the diverse spectrum of operations carried out within the expansive field of asymmetric synthesis. These accounts list many achievements in the subject, yet there are still important issues that offer promising areas for additional research and discovery.