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Software Review

Interactive Education Organic Chemistry - Animated Reaction Mechanisms 1

Reviewed by
Ronald Frederick Cole
University of Ulster **Ulster, United Kingdom**
RFJ.Cole@ulst.ac.uk

Interactive Education Organic Chemistry - Animated Reaction Mechanisms 1, developed by Robert Capon. ICV International Pty Ltd. Required hardware: PC: Multimedia PC (386DX 33 MHz, preferably 486DX 66 MHz) running Windows 95 or Windows 3.1, 8 MB RAM, 10 MB free hard disk space, VGA card with 256-color display, 640 x 480 resolution, audiocard, 2X CD-ROM. Apple Macintosh: (68040 LC minimum but 68040 or 75-MHz 601/ 603/ 604 recommended) running System 7 or later. 8 MB RAM, 16 MB RAM recommended, 256-color display, 640 x 480 resolution, 2X CD-ROM

Installation and Setup

- The instructions on the CD-ROM sleeve and the subsequent instructions in the "Read Me" and ChARMS documentation are very clear. The Organic Chemistry programs do not need to be installed but require Apple's QuickTime and Microsoft's PowerPoint Viewer. All the necessary programs are supplied on the CD-ROM, and clear instructions for their use are given.

Running ChARMS

- Depending upon the computer platform, this is done through the File Manager or Microsoft Internet Explorer. This is adequate for a one-off use of the ChARMs program but for continued use a program icon would be very useful.

The Programs

- After the title page, the Menu page provides active buttons that allow further pages to be viewed. The first set of navigation buttons gives access to a very clear introduction to the programs and navigation.

  On returning to the Menu page the user is presented with further menu choices:
  - Aromatics.
  - SN & E & Alkanes.
  - Carbonyl.
  - Lectures.

  The first three topics are animations; the final is in the form of PowerPoint slides.

The Animations

- Having selected an area of study, the user is presented with a set of menu choices; these lead to further choices allowing one to select a specific reaction mechanism with specific groups.

  Each mechanism is considered in electronic steps, which visualize the way in which the reactants interact with one another and the electrons rearrange as the intermediate and finally the products are formed.

  The animations are very smooth and well presented but have their limitations. On some occasions, ease of presentation has taken precedence over accuracy. For example, the attack on a planar carbocation from either side is shown as a restructuring of the carbocation with attack then occurring from the same side for the original and restructured carbocation. This provides the correct stereochemistries for the products, but I would have preferred to see attack from opposite sides with the resulting changes in stereochemistry, although this would have needed additional programming.

  The navigation is very clear and helpful until the first animation has been viewed and one must return to the Main Menu or Quit. It would be more useful to be able to remain with the study topic, rather than being forced to return to the main menu and select a further topic for study.

  Although an audio card is suggested, only navigation sounds are provided. There is no soundtrack and so the absence of an audio card would not be a disadvantage. There is no text in support of the animations. The selection of both background and animation colors is excellent, leading to very easily viewed animations. Each topic is presented in the same way, enhancing ease of use.

  A particular approach has been taken to the teaching of the selected topics. This should not be taken as a criticism per se, but I would consider that the animations do not make a stand alone self-paced/ distance learning package. However, the animations coupled with a workbook would make an excellent package.

  Considerable prior knowledge is assumed, and no reference is made to other packages, therefore if used in stand-alone format, a workbook would be essential.

The Lectures

- The lecture menu provides a far more extensive topic choice than the animations:
  - Bonds and Structure
  - Alkanes & Isomers
  - Aromatics
  - Alkenes
  - Alkanes & Stereoisomers
  - Alkanes & R vs S
  - Cycloalkanes
  - Alkynes
  - Functional Groups
  - NMR Spectroscopy
  - UV, IR & X-ray
  - Physical Properties
  - Organic Reactions
  - Acids & Bases
  - SN2
  - SN1
  - Elimination Reactions Electrophilic Reactions
  - Aromatic Substitution

- C=O Nucleophilic Substitution
- C=O Nucleophilic Addition
- Oxidation and Reduction
- Radical Reactions

These PowerPoint slides again reflect one particular approach to the teaching of organic chemistry. The documentation suggests that the 24 PowerPoint slide sets support 26 hours of instruction.

Familiarity with PowerPoint will be helpful when using the slides The slides relating to each topic are very well presented; there is good choice of color and a good linear progression through the topics. They provide an excellent resource that will be useful to many lecturers, in particular those embarking upon a teaching career in higher education.

The author has obviously tested the material during his lecture/ tutorial program over a number of years. It is well thought-out and presented and provides a very good program of instruction in organic chemistry.

Summary

- Using a scale of 1 - 5.
    - Ease of use: 5

      Quality of Documentation: 5

      Content: 5

      Usefulness to students: 3 (without supporting material), 5 (with supporting material).

      Usefulness to academic staff: 4. The animations and slides will be useful if the approach used by the author was selected, additionally the slides can be unpacked and used as PowerPoint is readily available.
