Media Reviews

***Periodic Table Live!*, 2nd Edition.** Alton J. Banks, Jon L. Holmes, Jerrold J. Jacobsen, John W. Moore, Paul F. Schatz, Jaclyn Tweedale, Jon C. Kotz, and Susan Young. Special Issue 17; CD-ROM for Macintosh and Windows; JCE Software, University of Wisconsin-Madison, 1101 University Ave., Madison, WI 53706-1396; Phone: (608) 262-5153 or (800) 991-5534; FAX: (608) 265-8094; e-mail: jcesoft@chem.wisc.edu; Prices/Licensing (prices for non-U.S. are in parentheses): single user on a single machine, $60 ($80); additional single user copies, $45 ($65); libraries, single machine, $120 ($140); networks, up to 12 simultaneous users, $240 ($260); networks, up to 50 simultaneous users, $800 ($820); networks, more than 50 simultaneous users, contact JCE Software for a quote.

According to the late American astronomer Harlow Shapley, the periodic table is "probably the most compact and meaningful compilation of knowledge that man has yet devised." Since Dmitrii Ivanovich Mendeleev first announced it in 1869, more than 700 different graphical representations of this cornerstone of modern inorganic chemistry have been published [1], and 3-D models have been devised for instructional use [2]. Now modern technology has succeeded in making Mendeleev's table available for chemical educators and students alike in a dazzling variety of aspects that would have seemed unbelievable to its inventor.

The first edition of *Periodic Table Live!* combined, on a single disc, material from three earlier JCE Software products: the digital video from *The Periodic Table CD-ROM* [3] with the graphical and descriptive databases of the elements from *Chemistry Navigator* [4] and *The Illustrated Periodic Table* [5] to form a unified, easy-to-use, dynamic tour of the periodic table. This edition transformed *PTL!* into an HTML format, making the presentation, content, and features available to both Apple Macintosh or Microsoft Windows users.

All of the video from the first edition has been redigitized from the original master tapes, re-edited, and compressed using the latest Apple QuickTime technology, resulting in higher quality digital video with smaller file sizes. However, only the latest hardware can take advantage of the high quality video; a lower quality version of the video is included for viewers lacking this hardware.

Yet the HTML-based format has required some tradeoffs. Instead of the interactive graphing module of the first edition using Microsoft Excel, charts of each property versus atomic number are available via the Chart tab. An Excel spreadsheet of the data presented in *PTL!* is available and can be used in Excel to create other types of graphs. Although the ability to search for a word or phrase is not available, JCE Software hopes to make both the interactive graphing and searching features available in future updates.

PTL!2 is easy to work with and so well organized that the average viewer will have no difficulty in using it. Opening the program leads the viewer directly to an interactive periodic table at the upper left of the page. Clicking the mouse on any symbol in the table takes one to the screen for that element. The left side of this page shows the entire periodic table with the position of the element highlighted, and it features reactions of the element, while the right side contains hypertext and numerical data.

The tabs at the top of the page determine the type of information displayed. The left side contains four tabs:

(1) The Video tab provides access to reactions of the elements.
(2) The Crystal tab presents a three-dimensional, computer-generated drawing of the element and a description of the structure, often including links to other representations of the structure.
(3) The Chart tab brings up a new browser window in which a property can be selected to be graphed versus atomic number.
(4) The Glossary tab opens a new browser window with a glossary of technical terms.

The right side contains three tabs:

(1) The Description tab provides access to information about the discovery, naming, common characteristics, occurrence, common reactions, and uses of the element.
(2) The Physical tab provides access to macroscopic properties such as boiling point, melting point, density, and numerous others. Many periodic table programs give some of the information listed in this section, but most do not include as much information, and this is the only one that we have seen that provides a section for the source of the element.
(3) The Atomic tab leads to information about electron affinity, ionization energy, electronegativity, atomic radius, and many other atomic characteristics. For this and the previous section, each property name is linked to its definition and a reference to the source of the data. Graphs as a function of atomic number are available for all numerical properties.

Most of the scientific information on this disc can be found on the Internet in different periodic table Websites, but *PTL!2*'s pictures and video clips are distinctive and special features lacking elsewhere. In some cases referencing a chemical reaction brings up a video clip demonstrating the reaction taking place and the color change if there is one. In many cases multiple pictures show the element in its common uses and its elemental forms.

Hardware and Software Requirements

- RAM: at least 24 MB RAM
- Drive: 4 × CD-ROM; hard disk
- Included Software: QuickTime 3; Adobe Acrobat Reader
  - WWW Browser (not included): Netscape Navigator 4 or higher, or Microsoft Internet Explorer 4 or higher
- For Mac OS
  Computer: Mac OS compatible
  CPU: Power PC; 150 or greater MHz recommended
  Graphics: 800 × 600 or greater; thousands or millions of colors

Operating System: System 7.6.1 or higher

- For Windows
  Computer: Windows compatible
  CPU: Pentium recommended
  Graphics: 800 × 600 or greater; 16-bit or 24-bit color
  Operating System: Windows 95 or 98

PTL Live! 2nd Edition is a stimulating interactive journey through the periodic table and its constituent elements that is suitable for chemistry students at all levels, especially in general, inorganic, and solid state chemistry. Additional information on JCE Software is available at its Website: http://jchemed.chem.wisc.edu/JCESoft.

References and Notes

1. See, e. g., Mazurs, E. G. *Graphic Representations of the Periodic System During One Hundred Years;* University of Alabama Press: Tuscaloosa, AL, 1974.
2. See, e. g., Kauffman, G. B. Review of Fernando Dufour's ElemenTree: A 3-D Periodic Table. Chem Educator **1999**, *4* (3), 121–122; DOI 10.1007/s000897990308a.
3. Banks, A. J.; Holmes, J. L. *The Periodic Table CD-ROM;* J. Chem. Educ. Software, SP10, 1995.
4. Kotz, J. C.; Young, S. *Chemistry Navigator;* J. Chem. Educ. Software, 6C, No. 2, 1994.
5. Schatz, P. F.; Moore, J. W.; Holmes, J. L.; Kotz, J. C. *The Illustrated Periodic Table;* J. Chem. Educ. Software, 2D, No. 2, 1995.

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The Science of Sugar Confectionery. W. P. Edwards, Royal Society of Chemistry, 2000. If you need a sound, informative, and easy to read introduction to sugar confectionery, this is the book for you. The author indicates that the target for this book is a lay audience, but there is still plenty here for the more scientific reader. Early on, Edwards indicates that much of what is known about sugar-based confections was obtained by trial-and-error. It is his job to go back and apply the science to these observations, and this is well accomplished.

The first five chapters introduce the subject, and cover the basic science and ingredients, as well as a brief introduction to the confectionery plant itself. I believe that Chapter 2 should be required reading for any student of food chemistry, if only to reinforce the importance and utility of such concepts as water activity, colligative properties of aqueous solutions, and the Maillard reaction. Chapter 3 provides complete coverage of ingredients, including sugars, dairy ingredients, vegetable fats, and hydrocolloids. Emulsifiers, colors, and flavors are treated separately in Chapter 4.

Beginning with Chapter 6 and going through Chapter 15, Edwards treats various types of confections and processes of producing them in turn: boiled sweets (non-crystalline candies), grained sugar products, pan coating, toffees and caramels, gum candies, chewing gum, aerated products, sugar free confectionery, lozenges, and tabletting. Of these chapters, perhaps the most interesting (because, as Edwards notes, it has the most science behind it) is the chapter on sugar-free confectionery. The reasons for producing such products and their advantages and disadvantages are detailed. The principal sugar substitutes (the polyols, including erythritol, sorbitol, maltitol, lactitol, isomalt, and polydextrose) as well as a range of intense sweeteners (aspartame, acesulfame K, saccharin, thaumatin, dihydrochalcone, and sucralose) are described. Also, the important notion of synergistic interaction between intense sweeteners is introduced in this chapter. As noted, this effect is more predominantly seen in soft drinks than in confectionery up to now.

For those with a practical bent, Chapter 16 will prove most interesting. Edwards has included a few experiments that illustrate many of the theoretical aspects described earlier in the book. The safety warnings are especially welcome as they are frequently ignored in other presentations of hot sugar syrup manipulation. The experiments presented deal with sugar crystallization and the factors that affect its extent and rate, lozenge making and the importance of the binder in this process, and fudge (with a lot of potential variations). Also included at the end of this chapter is a particularly useful discussion of taste testing and what it means for one sample to be statistically significantly different from another.

There are a few errors and typos that will show up, as in any book, but they are generally so minor as to not really require mentioning in any detail. If you are thinking of going into the confectionery business or just want to know a little more about candy in general, Edwards book should be on your "to purchase" list.

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