Chemistry Comes Alive!, Volume 6; Abstract of Special Issue 30, a CD-ROM of Laboratory Techniques

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Chemistry Comes Alive!, Volume 6

Abstract of Special Issue 30, a CD-ROM of Laboratory Techniques

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Chemistry Comes Alive! Volume 6: Laboratory Techniques, contains more than 600 QuickTime movies and more than 3600 still images that illustrate laboratory procedures and techniques. The laboratory equipment and techniques demonstrated on Chemistry Comes Alive! Volume 6 have been selected to include those that students typically need to learn in general chemistry, analytical chemistry, and organic chemistry courses.

The CD-ROM's broad coverage of techniques and apparatus is evident from the summary contents on p 1382. All of the CD-ROM's content is accessible under the heading Chemistry Laboratory Techniques. Techniques suitable for highly accurate analytical chemistry have been collected under Quantitative Techniques in Volumetric Analysis.

The videos and still images from Chemistry Comes Alive! Volume 6 have been carefully organized to make it easy for you to find what you need. They can be used for pre-laboratory instruction either directly from the CD-ROM or by incorporating them into your own multimedia presentations. They are especially useful for illustrating customized laboratory manuals that are locally written and printed. Often both correct and incorrect techniques are demonstrated. These can be used in lessons or quizzes where students are asked to identify errors in technique or to select the best technique from several possibilities.

Using a weighing spoon to transfer solid.

How to Use Chemistry Comes Alive!

Each Chemistry Comes Alive! CD-ROM is like a Web site—you can access it with a Web browser such as Netscape or Internet Explorer. You can locate the content you want to use via a:

- Text-based table of contents (see p 1382).
- Visual interface that parallels the table of contents.
- List of keywords.
- Search for a topic or word.

The CD-ROM includes a link to *JCE Online* where you can use a complete index of all Chemistry Comes Alive! volumes to find the videos you want to use.

Once you find the videos or still images you want, you can easily bookmark them in your browser for quick, convenient presentation to a class. You can also view movies using the QuickTime Player. Or you can copy and paste them into a PowerPoint or other multimedia presentation or a lesson written in HTML. Directions for doing this are available at *http://jchemed.chem.wisc.edu/Workshops/JCEVideo/*. You can use the video freely in your own presentations, but an additional license is required before you place any Chemistry Comes Alive! video on your local WWW server or LAN.

Let us know how you use Chemistry Comes Alive! in your classroom or laboratory teaching. We will share with others all ideas that we receive. If you create a new presentation or lesson using this video, contribute it to *JCE* WebWare or *JCE Software* and thereby share it with others.

About the Chemistry Comes Alive! (CCA!) Series

The Chemistry Comes Alive! series includes five additional CD-ROMs *(1–5)*. In each the emphasis is on the chemistry. Reactions and laboratory techniques are shown close up. Only where scale is important can more than the demonstrator's hands be seen. Most movies in CCA! include a voice-over narration, which is also provided as text on the same page where the video is found. The sound of a reaction or process is included when it is important. Chemical reactions, demonstrations, and laboratory techniques have been chosen because they involve an important aspect of chemistry, involve substances or equipment that are not available in many schools, are hazardous, or cause problems of disposal or cleanup. CCA! content is certain to stimulate students' curiosity and help them learn. To make it as useful to you as possible, a group of knowledgeable chemistry

continued on p 1383

Content of Chemistry Comes Alive!, Volume 6: Laboratory Techniques

Chemistry Laboratory Techniques

1. Manipulating and Transferring Samples

Heating and Cooling
- Selecting a Heat Source
- Gas Burner
- Hot Plate
- Reflux: Reactions at Constant Temperature
- Preparing an Ice Bath

Mixing
- Mechanical Mixing
- Magnetic Stirrer
- Manual Mixing
- Mixing Safely

Transferring Samples
- Obtaining a Liquid Sample
- Pouring
- Quantitative Transfer

2. Measuring

Electrical Properties
- Conductivity Meter
- Voltage of an Electrochemical Cell

Mass
- Analytical Balance
- Top-Loading Balance
- Top-Loading Balance with Draft Shield

pH
- pH Meter
- pH Paper

Pressure
- Barometer
- McLeod Gauge Manometer

Recording Data
- Chart Recorder
- Reading a Scale

Spectroscopy
- Spectroscope
- Spectronic 20 Spectrophotometer
- Single-Beam Recording Spectrophotometer
- Double-Beam Recording Spectrophotometer
- Diode-Array Spectrophotometer

Temperature
- Thermometer
- Calorimeter
- Melting Point Apparatus

Titration
- Titration Techniques and Concepts
- A Complete Acid–Base Titration
- Procedures and Mistakes

Volume
- Precision of Measurement
- Buret
- Graduated Cylinder
- Pipets
- Volumetric Flask

3. Separating and Purifying

Centrifuge
- Loading and Unloading a Centrifuge
- Centrifuging a Sample
- Removing Supernatant and Washing Precipitate

Chromatography
- Paper Chromatography
- Thin-Layer Chromatography
- Gas Chromatography

Distillation
- Simple Distillation
- Distillation at Reduced Pressure
- Using a Rotary Evaporator

Extraction
- Separatory Funnel
- Product Isolation

Filtration
- Gravity Filtration
- Vacuum Filtration

Recrystallization
- Single-Solvent Method
- Two-Solvent Method

4. Safety
- Eye Protection
- Handling and Mixing Chemicals
- Handling Glassware
- Heating and Hot Items
- Loose Clothing, Hair, and Jewelry
- Pipetting
- Safe Lab Setting

Quantitative Techniques in Volumetric Analysis

1. Quantitative Techniques Introduction

2. Quantitative Weighing
- Quantitative Transfer of a Solid with a Weighing Spoon
- Quantitative Transfer of a Solid with a Finger-Held Weighing Bottle
- Quantitative Transfer of a Solid with a Paper Strap-Held Bottle
- Quantitative Transfer of a Solid with a Spatula
- Quantitative Weighing Errors

3. Quantitative Transfer
- Solid from Dish to Beaker to Volumetric Flask
- Solid from Dish to Volumetric Flask
- Quantitative Transfer with a Volumetric Pipet

4. Quantitative Acid–Base Titration
- A Complete Acid–Base Titration
- Variations in Technique for Handling Stopcocks

Table 1. Hardware and Software Required for Chemistry Comes Alive!, Volume 6

Computer	CPU	RAM	Drives	Graphics	System	Other Software
Mac OS Compatible	PowerPC; ≥ 150MHz recommended	≥ 64 MB	≥ 4 × CD-ROM; Hard disk	≥ 800 × 600; thousands or millions of colors	Mac OS 8.6 or higher	QuickTime 5; Netscape Navigator 4 or higher OR Microsoft Internet Explorer 4 or higher
Windows Compatible	Pentium; ≥ 150MHz recommended	≥ 64 MB	≥ 4 × CD-ROM; Hard disk	≥ 800 × 600; 16-bit or 24-bit color	Windows 98, ME, 2000, XP, NT	QuickTime 5; Netscape Navigator 4 or higher OR Microsoft Internet Explorer 4 or higher

continued from p 1381

teachers has divided the CCA! series into several volumes, each of which contains closely related material.

Acknowledgments

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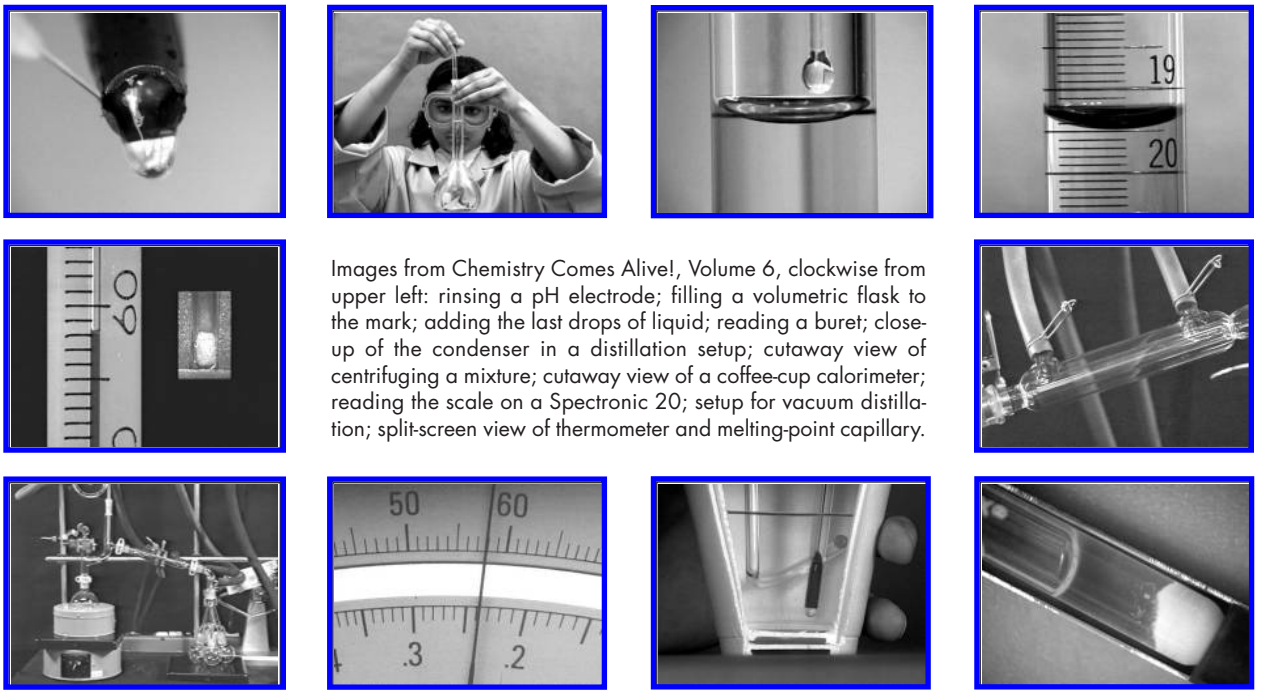
Many individuals made significant contributions to the development of this project. Video from ChemPages Laboratory CD-ROM *(6)* was produced by Jerrold J. Jacobsen and Randall J. Wildman of University of Wisconsin–Madison with contributions from Joe L. March, John W. Moore, Gordon Bain, Ed Fedosky, Yao-Ying Chein, Mary Engler, John Fulmer, Kelly Jetzer, Teri Larson, Amy Melvin, Stephanie Pitz, Jason Ratzenberg, Jacquie Scott, and Paula Schlax. Video from Titration Techniques *(7)* was produced by Jerrold J. Jacobsen, Kelley Houston Jetzer, Néha Patani of University of Wisconsin–Madison; John Zimmerman of Wabash College, and Gerald Zweerink of Missouri Western State College. Video from Quantitative Techniques in Volumetric Analysis videotape *(8)* was produced by John Zimmerman of Wabash College and Jerrold J. Jacobsen of University of Wisconsin–Madison. Video from Techniques in Organic Chemistry Parts I and II videotape *(9, 10)* was produced by Lois M. Browne, Karine Auclair, Minh N. Vo, Sandra L. Kenefick, Neal N. Fong, Marcia Anstee, Jon P. Carstensen, Timothy T. Van Vliet, Craig J. Railton, Philip L. Wickens, and Todd DeMone of the University of Alberta and Video Masters Multimedia Productions Inc. (Durekt Productions) with funding from the University Teaching Research Fund and the Department of Chemistry, University of Alberta.

Price and Ordering

Price for this CD-ROM for Macintosh and Windows: Single user on a single machine: $75 U.S./$95 non-U.S. LANs (up to 12 users): $300 U.S./$320 non-U.S. Prices for libraries and wide area networks or other information may

Selected Images from Chemistry Comes Alive!, Volume 6



Images from Chemistry Comes Alive!, Volume 6, clockwise from upper left: rinsing a pH electrode; filling a volumetric flask to the mark; adding the last drops of liquid; reading a buret; close-up of the condenser in a distillation setup; cutaway view of centrifuging a mixture; cutaway view of a coffee-cup calorimeter; reading the scale on a Spectronic 20; setup for vacuum distillation; split-screen view of thermometer and melting-point capillary.

be obtained by contacting *JCE Software*, University of Wisconsin–Madison, 1101 University Avenue, Madison, WI 53706-1396; phone: 608/262-5153 or 800/991-5534; fax: 608/265-8094; email: *jcesoft@chem.wisc.edu*.

An order form is inserted in this issue that also provides prices and other ordering information. Information about all *JCE* publications (including abstracts, descriptions, updates) is available from our World Wide Web site at *http://jchemed.chem.wisc.edu/JCESoft*.

Hardware and Software Requirements

Hardware and software requirements for Chemistry Comes Alive! Volume 6 are listed in Table 1.

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