
a) fusion of H nuclei to form He nuclei
b) fission of He nuclei to form H nuclei
c) fission of U-238 nuclei
d) fission of U-235 nuclei
e) fusion of deuterium and tritium nuclei

The question starts with an HTML name. In this question, Question 06, the <a name="06"> is the target of the right- response file for question #05. This is what brings the browser back to question 06 of the quiz.htm file when the student clicks at the return-to-quiz link of the right-response file for Question 05.

The five choices are coded as an unnumbered list. Response *a)*, the correct response in this case, is coded to take the student to the right-response file for this question, no06.htm; all others are coded for one of the five wrong-response files.

A typical quiz footer:

<hr>
= THE END =
 You now have the choice of:

returning to Question #01 to repeat the quiz, or
returning to the file examination menu

</body>
</html>

Following a hard rule <hr>, a section named "51" (for a 50- question examination) gives students the options of returning to Question 01 of the examination or returning to a menu of file examinations. This footer must be coded <a name="[nn+1]"> where nn is the number of the last question on the examination.

Every quiz file is named quiz.htm. Multiple quizzes are distinguished from each other by the names of their storage directories.

Link colors:

Placing the code <body link="#228B22" vlink="#228B22"> early in the quiz file prevents the browser from changing the colors of the links as they are clicked. Thus good choices made by the first student to take the quiz don't reveal the right answers to subsequent students (using the same computer) through color changes in links.

OTHER CONSIDERATIONS

The simplicity of HTML coding requires that every examination file, together with all its right- and wrong-response files, be placed in a unique directory on a server. The entire set of both right- and wrong-response files must be placed in every directory containing a quiz. This approach is demanding of server space, but that is a cost of its simplicity.

As with any other html document, graphics such as .gif or .jpg files can be inserted into the right- and wrong-response and quiz files. For rapid downloading via modems, I avoid graphic and other binary files except where graphics are integral parts of the questions.

Although beyond the scope of this discussion, the use of word- processor macros facilitates immensely the conversion of classroom examinations into these HTML quizzes Anyone interested in copies of the macros I have written for use with my DOS-based, WordPerfect 5.1+ word processor may contact me. With these or other macros, the only time-consuming activity, other than proofreading, is identifying correct answers and entering the appropriate right-answer code by hand.

Finally, the HTML coding described here is effective with the currently available Netscape Communicator. While other browsers, or later versions of this browser, may require (or benefit from) different coding, the strategy described here should be generally and consistently useful.

Searching for Images on the World Wide Web

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An important part of the success of presentation software is the use of appropriate images to reinforce and clarify the lecture. Many commercial textbooks now include CD-ROMs that provide images that may be used for lectures, but these are not

always appropriate. The web is an excellent alternative, since many web pages include images. Unfortunately, it can be a discouraging job to find the desired needle in the midst of the 800 million pages of the WWW haystack. There are, however, several resources that can make this searching easier and more likely to be successful.

When selecting images from the WWW, be sure to take copyright into consideration. Many sites include a statement of copyright policies. Be sure to read these notices before using any images. Some sites copyright all images (even if their right to do so may be questionable); other site owners explicitly state that none of the images are copyrighted and invite educational use.

Sites for General Purpose Images

Often it is possible to use general purpose images from the Web to illustrate chemical principles and to make the lecture more realistic. The Mugar Memorial Library, one of the Boston University Libraries (http://www.bu.edu/library/instruction/webimages-x.htm), has an excellent set of links to sites dealing with general purpose images. Paula Berinstein's directory of image sites is also very good. (http://www.berinsteinresearch.com/fiolinks.htm). Berinstein says that her directory of image sites is "not exhaustive," but it certainly comes close. Another extensive resource is the Digital Librarian site (http://www.servtech.com/~mvail/images.html) maintained by Margaret Vail Anderson, a librarian in Cortland, NY. Finally, the Berkeley Public Library supports the Librarians Index to the Internet (http://sunsite.berkeley.edu/cgi bin/searchindex), another searchable listing of image-rich sites.

Special Sites for History of Science Images

The most efficient strategy is to look at sites devoted to science. For example, several web sites are dedicated to pictures of individual scientists. John L. Park, of ChemTeam, runs an on-line gallery of famous chemists at (http://dbhs.wvusd.k12.ca.us/Gallery/GalleryMenu.html).Harry Nelson's site (http://charm.physics.ucsb.edu/people/hnn/physicists.html) also has pictures of famous scientists (mainly physicists). In addition, Nelson includes excellent links to more image-rich sites. Another good source of pictures of famous scientists is the Niels Bohr Library of the Center for History of Physics at the American Institute of Physics (http://www.aip.org/history/esva/). The main focus here is twentieth century American physicists and astronomers, but many other images are also included. The Edgar Fahs Smith Memorial Collection at The University of Pennsylvania consists of over 3,000 pictures of scientists, laboratories, and scientific apparatus, and a selection of these images is at (http://www.library.upenn.edu/etext/smith/). Search Engines

Search engines offer general search capabilities for information of interest on the Internet. Several search engines are dedicated only to finding images. These engines are usually for general purpose pictures, but often there are images that are appropriate for a chemistry lecture. A good first stop for any search is the web site maintained by Debbie Abilock of the Nueva Library. Debbie attempts to match the type of search with the best web resources and does a fine job. (http://www.nueva.pvt.k12.ca.us/~debbie /library/research/adviceengine.html).

Image Search Engines

Ditto.com (www.ditto.com) is an excellent search engine devoted only to images. This site, formerly called Arribavista, may be searched by key words, and returns thumbnail versions of each image. It currently lists approximately 1.5 million images and is expanding to over 2.5 million images. This search engine can be very effective when looking for general purpose images.

Proteus (http://www.thrall.org/proimage.html) is a meta search engine for images. The sites that are searchable include AltaVista Photo Finder, The Amazing Picture Machine, The Lycos Image Gallery, and Columbia University's WebSEEk. Besides giving the option of searching eight different on-line collections of images, there is also a good list of links to further image sites that must be searched individually.

The major photo collections searchable by Proteus, can also be searched individually. AltaVista Photo Finder (http://image.altavista.com/cgi-bin/avncgi) searches 17 million images, audio clips and video files from the web and private collections. The Amazing Picture Machine (http://www.ncrtec.org/picture.htm) is operated by The North Central Regional Technology in Education Consortium. The list of the types of pictures available does not include many specific science categories, but this site is sometimes useful. The Lycos Image Gallery (http://www.lycos.com/picturethis/), provides two options; search through more than 80,000 free images, current pictures and vintage illustrations on the Lycos Image Collection or search the entire web.

Columbia University's Webseek (http://disney.ctr.columbia.edu /WebSEEk/) does not appear to have many scientific images. The American Memory site (http://memory.loc.gov/ammem /amhome.html) is

a good place to look for historical U.S. Images. This web site allows a search of the Library of Congress Historical Collections, which includes a technology and applied sciences section.

General Search Engines

Most of the popular search engines allow the basic search to be modified by requiring that an image be present. Unfortunately, this is not always adequate. Some engines, like AltaVista, list only images and even give a thumbnail copy, but some other engines will list any page that has the keyword requested and any type of image, including banners, logos, etc. Often the latter approach does not limit the search sufficiently. Searching for the word for chemistry with the image option on, the result may be pages about chemistry that have images, but the images may not be very chemical. This is why the search engines that have gathered a searchable list of specific images are often a better bet for finding something useful.

Field Searching

Another way to find chemical images on web pages is to use field searching. Every Web page includes field information, which specifies date, title, type of page (i.e., image, video, audio, etc) etc. Limiting the search to a specific field can narrow the focus and eliminate many useless pages. For example, to search for images of robins, enter the following: Image: robin. i.e. (field type): keyword Of course, many robin images may have names like bird and so may not be found in this way. Field searching is usually the last recourse, but sometimes it is the only way to get the image that is needed.

Field searching can help to avoid copyright problems if the web images are found on U.S. Government sites. GovBot (http://ciir2.cs.umass.edu/Govbot/) will search only these sites. This engine, supported by The Center for Intelligent Information Retrieval (NSF sponsored), searches a database of over one millionU.S. Government and military pages. Field searching is a little more complicated here (Be Sure to Read the Hints Link!), but it is possible to select images from this impressive collection. Unfortunately, this site does not provide thumbnail images for previewing.

Other Potentially Helpful Sites

As the name implies, Free Graphics (http://www.freegraphics.com/) offers links to "the top 508 graphic links on the Internet!" that may be used without charge. There is not much chemistry here, but the site is a good source of buttons, bullets, etc. It is another way to avoid copyright problems. The links to Create Your Own Graphics (http://www.freegraphics.com/11_Online_Create_Your_Own/) can be helpful when designing banners, buttons, etc. for a web page.

The TechSmith site (http://www.techsmith.com/) lists several types of shareware software that may be of interest, including a program called Snagit. According to the description, Snagit "captures anything on the Windows desktop quickly and easily." A screen capture tool like this can be very helpful in some situations. An on-line version of this article with clickable links will be found at http://snyoneab.oneonta.edu/~pencehe/imagesearch.html.

ON-LINE CONFERENCE ON "TEACHING SPECTROSCOPY"

OCTOBER 31 TO DECEMBER 3, 1999

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The focus of the conference will be: Developments in spectroscopy and innovative strategies for teaching spectroscopy in the undergraduate curriculum.

Spectroscopy is used throughout the undergraduate chemistry curriculum and spectroscopic techniques are undergoing continual innovation. As a result, it is a challenge to decide what topics to teach and when to teach them. This conference will highlight recent developments in spectroscopy and introduce innovative teaching techniques. An additional goal of this conference is to generate discussion about teaching spectroscopy at all levels of the undergraduate curriculum.

This on-line conference will be held utilizing the World Wide Web for distribution of abstracts and papers. The home page for the conference is: http://www.ched-ccce.org/confchem/1999/d/

Questions and discussion will occur using Majordomo. The final version of the material for discussion will be available three weeks before the start of the conference. There is no registration fee for this online conference. OnLine discussion will occur on the CONFCHEM Majordomo. To register, subscribe by sending the following text in the body of an email message to majordomo@CLARKSON.EDU.