

INTERACTIVE SIMULATIONS FOR CLASSROOM USE

John S. Martin

Department of Chemistry, The University of Alberta,

Edmonton, Alberta, Canada T6G 2G2

john.martin@ualberta.ca

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In 1996 I published the Simulations and Interactive Resources (1), a DOS utility which is now available on the General Chemistry CD-ROM, Special Issue No. 16, third edition, of the Journal of Chemical Education: Software. These have been used worldwide. This report describes a new, enhanced Windows version of the SIRs. They are nearly complete, and are being tested in a number of introductory chemistry courses.

They are interactive illustrations, simulations and animations of general chemical principles, for classroom use by means of a projection monitor. They are completely under the control of the instructor, using an intuitive mouse-controlled interface.

Context-sensitive help is always available, and it is quite possible to learn from the help all about a SIR and its uses. Needless to say it's prudent to use the help when preparing a presentation rather than during it – but the help is there if you need it.

The most significant property of the SIRs is that they do not interrupt one's presentation, and they may be adapted to almost any pedagogical approach. They may be brought in spontaneously when a relevant point arises, so that they lend themselves to interactive instruction. The instructor may ask the class (or students may ask the instructor) "What do you think would happen if...?" and the computer will then provide the answer – and very likely stimulate the next question.

Here is the general index page. The twenty-two complete SIRs are in dark lettering. The general topics covered are the periodic table, atomic structure, pressure, phase equilibrium and gases, chemical thermodynamics, equilibrium, acids and bases, electrochemistry, kinetics and mathematical functions.

fig1.jpg (88356 bytes)

Windows-based "Smart Instructor's Resources"
by John S. Martin, University of Alberta

a. SIR PERIODIC	b. SIR ORBITAL	c. SIR ATOMIC
d. SIR TORR	e. SIR EBULLIENT	f. SIR IDEAL
g. SIR DALTON	h. SIR CALORIC	i. SIR ENTROPY
j. SIR REACT	k. SIR DYNAMIC	l. SIR Q
m. SIR K	n. SIR TITRATE	o. SIR UNKNOWN
p. SIR BUFFER	q. SIR POLARITY	r. SIR FARADAY
s. SIR VOLTA	t. SIR RATE	u. SIR INITIAL
v. SIR ISOLATE	w. SIR SEQUENT	x. SIR GRAPHIC

QUIT (Click here to leave)
CLICK HERE FOR AN ANALYTIC INDEX

Though the Windows SIRs are still incomplete, the finished ones have been and are being tested by my colleagues here and elsewhere. Student response has been consistently enthusiastic.

If you would like to try them, please e-mail me at the above address on page 1. I would expect that anyone receiving a trial copy would let me know what works and what doesn't. The more testing these SIRs receive, the better they will be when they are finally published.

Acknowledgements

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Bibliography

1. Martin, J. S. SIRS III: Simulations and Interactive Resources. *J. Chem. Educ. Software*, **1996**, 9B, No. 2.

[Click to see the analytic index, which lets you find SIRs relevant to various topics](#)

[Click to see how you might use SIR DYNAMIC to model the approach to equilibrium](#)

[Click to see how you may use SIR Q to follow real reactions to equilibrium](#)

[Click to see how you may use SIR Q to discover the law of mass action](#)

[Click to see how SIR POLARITY can reconcile "chemistry electricity" and "physics electricity"](#)

[Click to see how you may use SIR POLARITY to probe the workings of an electrolytic cell and a reversible cell](#)

[Click to see how you may use SIR POLARITY to probe the workings of voltaic cells](#)

[Click to see how you may use SIR POLARITY to discover the meaning of the "cell convention"](#)

[Click to download SIR DYNAMIC, and try it out yourself. \(1.4 MB\)](#)