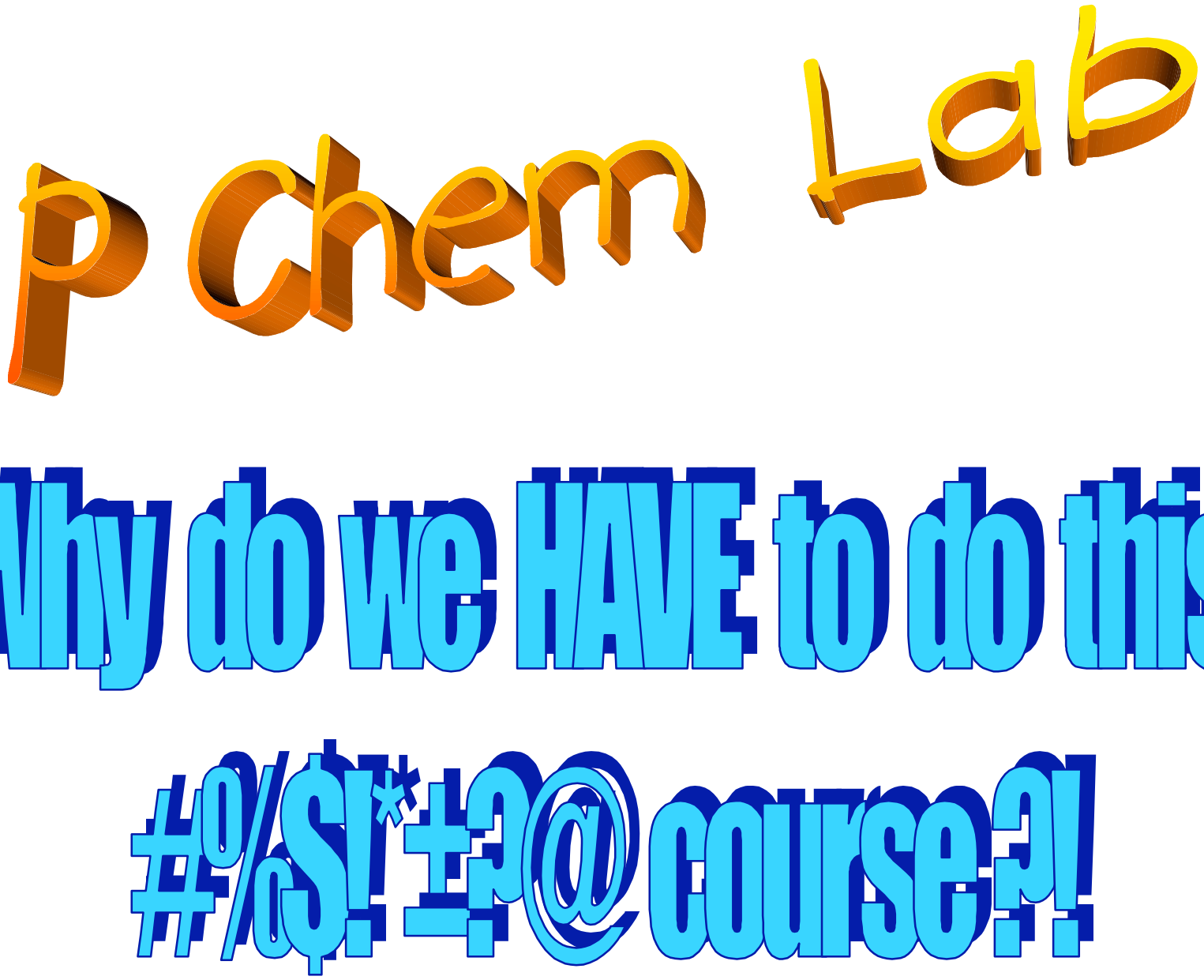

p Chem Lab
Why do we HAVE to do this
#%$!*±?@ course?!

> ACS Guidelines

> ACS Guidelines Revision Process

Undergraduate Professional Education in Chemistry: Guidelines and Evaluation Procedures

Spring 2003 Guidelines*
Topical Supplements to the Guidelines

should be made to use various forms of multimedia learning resources such as computers, slide and videotape presentations, hands-on classroom activities, and Internet-based instructional materials.

Laboratory Work in Chemistry. Laboratory instruction should include practical experience with instrumentation for spectroscopy, chemical separations, and electrochemical methods. It should give students hands-on experience with chemistry and the self-confidence and competence to

- keep legible and complete experimental records;
- synthesize and characterize inorganic and organic compounds;
- perform accurate and precise quantitative measurements;
- use and understand modern instruments, particularly NMR, FT-IR, and UV-vis spectrometers; GC, GC-MS, and HPLC instruments for chemical separations; and electrochemical instruments;
- interpret experimental results and draw reasonable conclusions;
- analyze data statistically and assess reliability of results;
- anticipate, recognize, and respond properly to hazards of chemical manipulations;

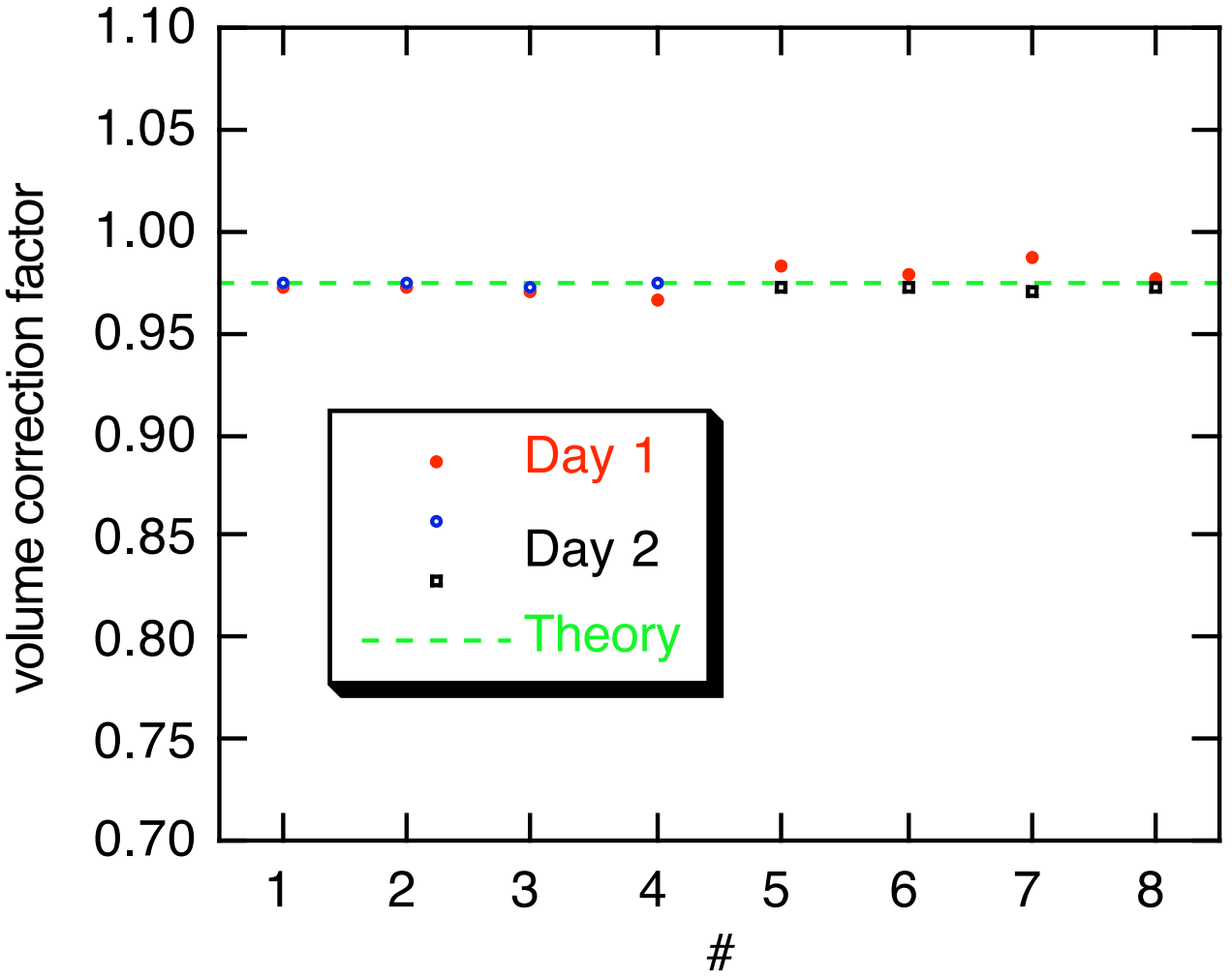
- anticipate, recognize, and respond properly to hazards of chemical manipulations;
- design experiments;
- plan and execute experiments based on searching and using the literature;
- communicate effectively through oral and written reports; and
- work effectively in small groups and teams.

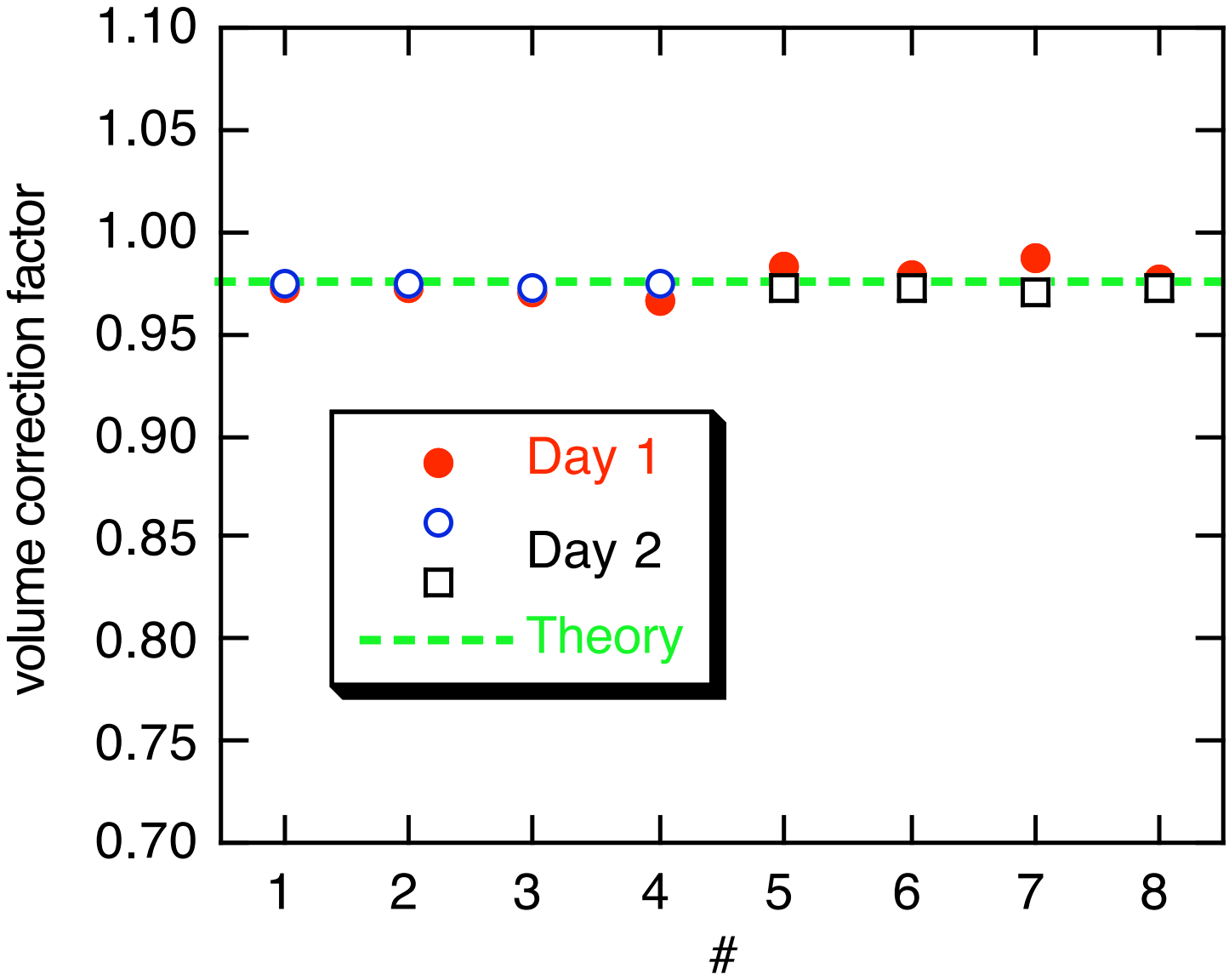
Related Studies. Well-prepared students should emerge from a program in chemistry with

- a firm foundation in the fundamentals and applications of calculus, including proficiency with partial derivatives and some knowledge of differential equations;
- an understanding of the basic principles of linear algebra;
- practical knowledge of statistics with applications to validation of data and design of experiments;
- experience with computers, including an ability to use word processors, spreadsheets, numerical and nonnumerical algorithms, simulations and computation, data acquisition, and databases for information handling and retrieval; and
- a good foundation in physics.

Chemistry pervades our modern social and economic life. All chemists, including

Accuracy and Precision
("agreement" and "disagreement")

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Day 1
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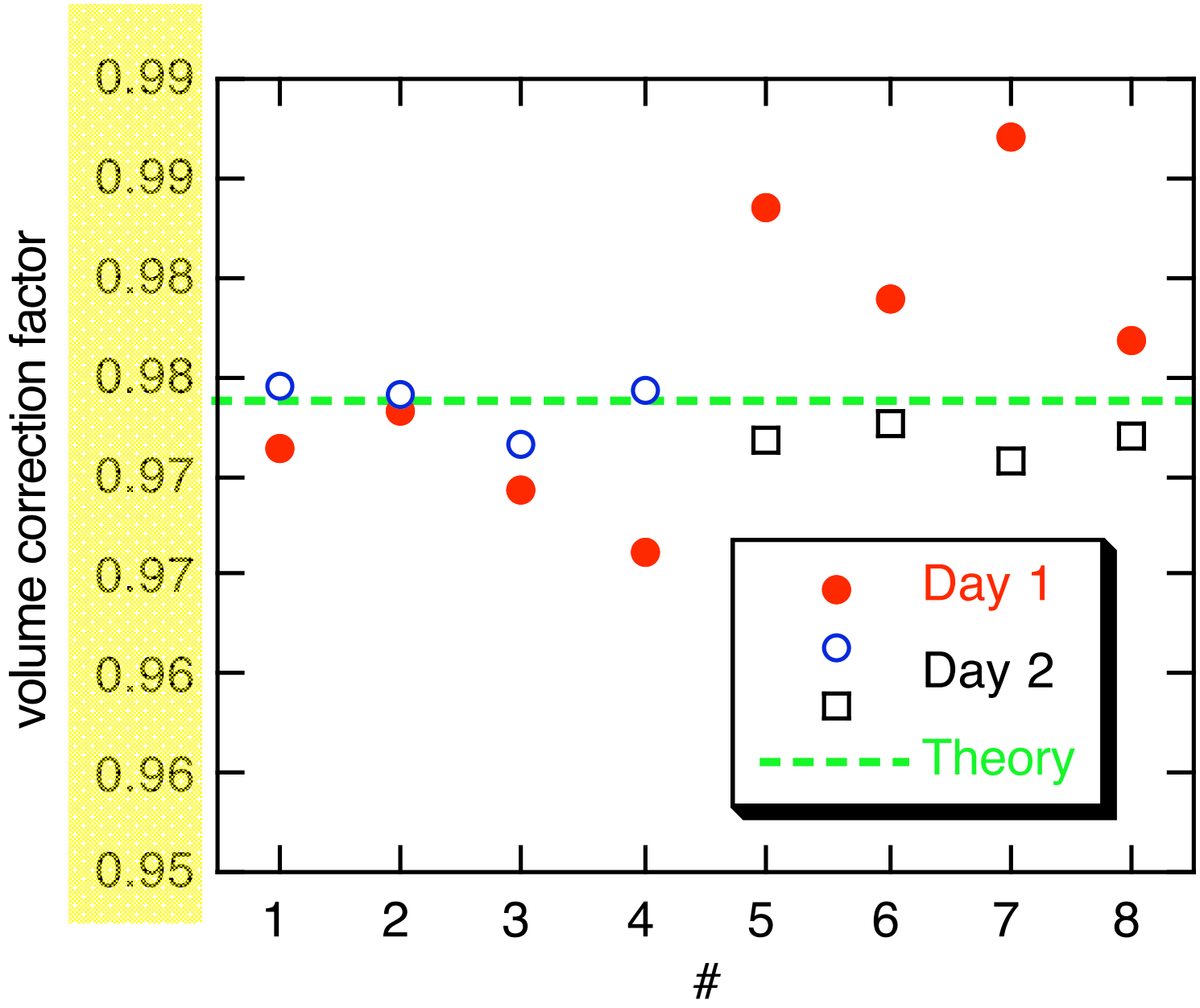
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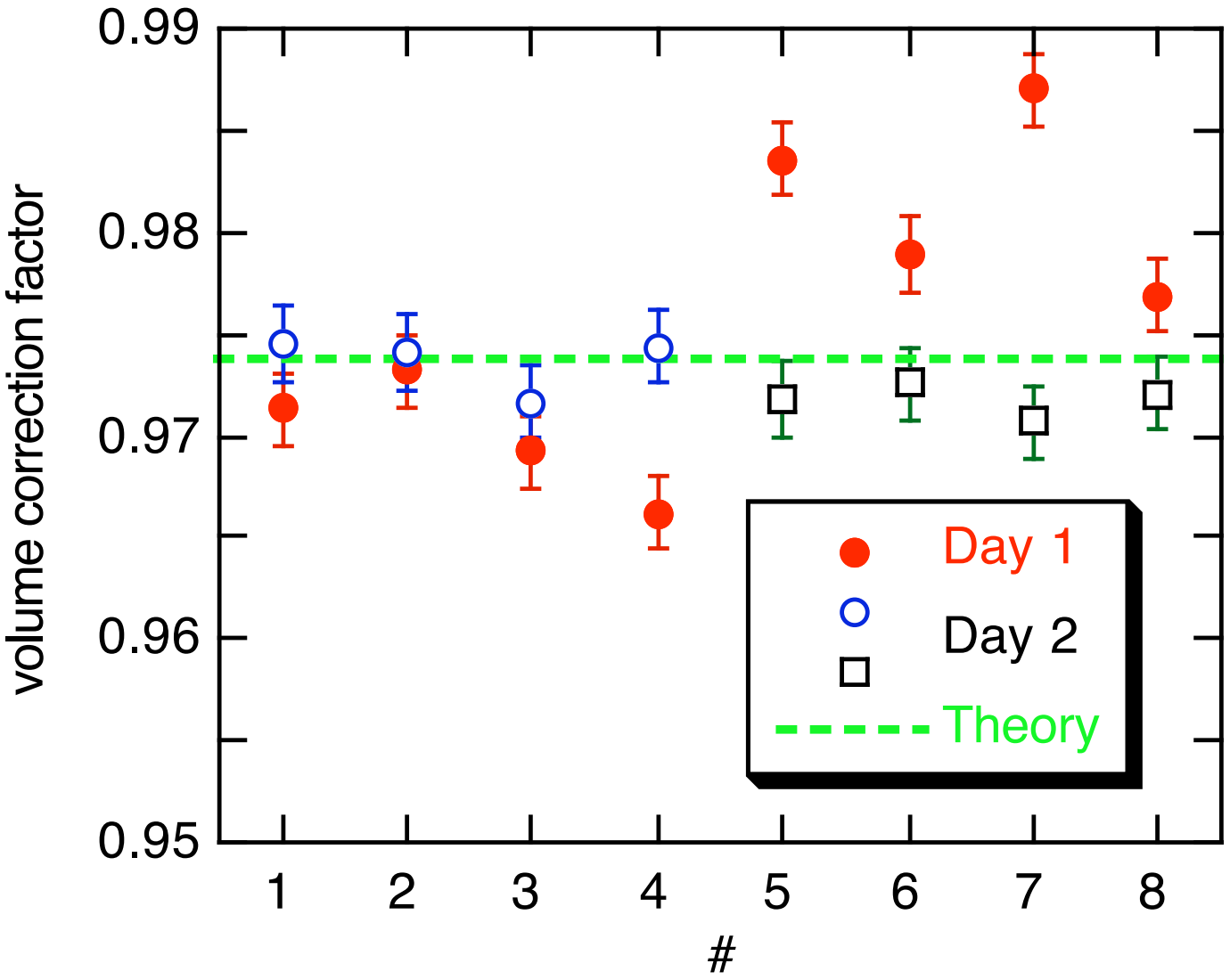
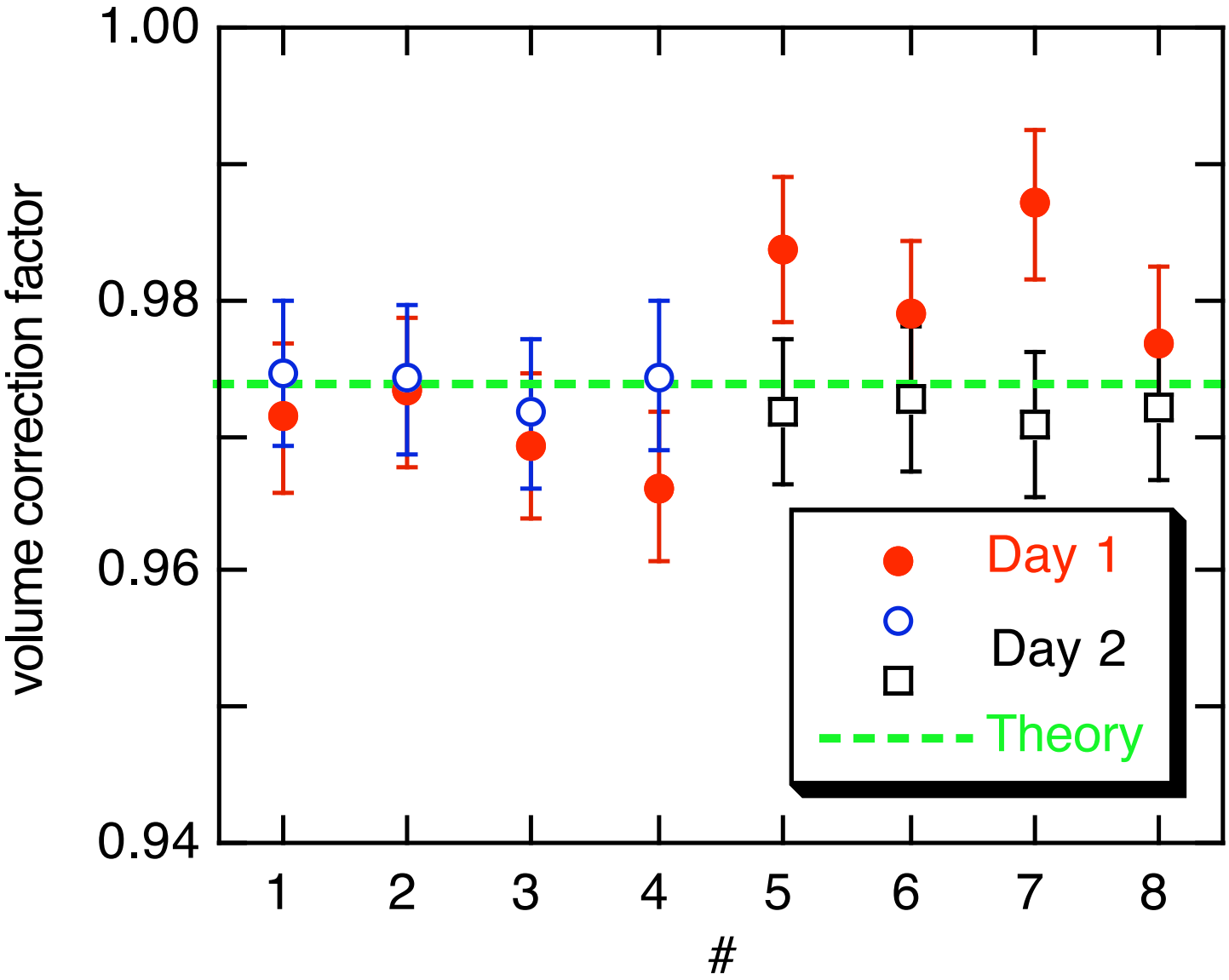
Day 1
Day 2
Theory

[Error bars are 1 standard deviation (1 □)]



[Now 3 □]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Day 1
Day 2
Theory

[Values are means; error bars are standard deviation in the mean (also called standard error)]