

Guide to Science Olympiad's Chemistry Lab

Calton Kong and Eric Ma

Hello!

This is our guide to preparing for the Science Olympiad event Chemistry Lab. Specifics will be based on last year's chem lab topics, but general advice will apply to any Chem Lab topic rotation. We were both located in the Bay Area during high school and competed in this event. I (Eric) got a lot of help with chemistry in general from Calton, and we are passing on a couple tips to hopefully improve the competitiveness and quality of the event.

General notes on the event:

At nearly every level that you will encounter, Chem Lab will not have advanced topics or conceptually/mathematically difficult questions. (In fact, this is true for every SciOly event.) While a couple tournaments held at universities will probably feature more challenging tests, including one for this event, the majority of the time, you will be taking an AP Chem-level test. Thus, unless you are 110% confident solving the questions in AP Chemistry, it is not worth it to work on more challenging chemistry. In any case, the most important thing in this event is to be able to solve relatively simple questions with very high speed and accuracy.

I'd also say that SciOly Chemistry Lab is essentially a subset of a competition called the US National Chemistry Olympiad (USNCO) and is significantly easier in difficulty. They both have a written and laboratory portion that are often similar in style. Any advice you see on studying for USNCO is probably applicable in some way to studying for Chem Lab. If you are very good at USNCO and are considering joining SciOly, your team would probably love to have you compete in Chemistry Lab (and the time investment will be close to 0 on this event).

Basics

Most of this section will be covered by reading the introductory chapters of an AP Chem textbook.

- Know the periodic table. Make sure you know how to read the table and know the basic trends on it. Know your stoichiometry, this is part of nearly every calculation question.
- Memorizing atomic weights of common elements such as C, N, O, F, Cl, S, H, Na, K, Ca, and Mg will make calculations slightly faster. However, actively memorizing these would probably be a waste of time; they should start to stick after checking the periodic table many times.
- Be familiar with assigning oxidation states and knowing common oxidation states.
- For some years, it will be imperative you know basic periodic trends like electronegativity, ionization energy, electron affinity, metallic character, and atomic radius, but in general knowing these can help you make educated guesses on more difficult questions and they can improve your chemical intuition to help you avoid silly mistakes.
- Familiarize yourself with common cations and anions (mostly anions). You can find these in any chemistry textbook and online.

Please have common sense in the lab.

- Make sure you know how to use the provided lab equipment. For this topic rotation, make sure you know how to use a buret and calorimeter. Failing to do so will not only cost you the medal but can potentially endanger yourself and others.

Chem Lab Study Guide Science Olympiad

Priti Singhal



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