

SF SANTA FE COLLEGE

NATURAL SCIENCES DEPARTMENT - CHEMISTRY

Introduction

The chemistry placement exam has 50 multiple choice questions that cover all foundational topics need to progress into general chemistry 1. Be sure to select the correct answer NOT BY GUESSING, but based on proper calculation set-ups or drawings of Lewis and VSEPR (3D) structures.

You will have exactly *120 minutes to finish your test*. The exam is timed. Please remember to bring a non-programmable calculator to use it on the exam. Programmable (also known as graphing) calculators are not permitted on the exam.

What is provided for you?

- ✓ A periodic table and a list of common physical constants.
- ✓ A scantron sheet to bubble in your chosen answers.
- ✓ Scratch paper.

Suggested Strategies

- ✓ **Don't allow yourself to get stuck on a single problem.** If you don't know how to work out a question, move along and return to it later.
- ✓ Consider circling answers, about 4 questions at a time, on the question paper and bubbling all these on the answer sheet at one time.
- ✓ Spend the least time on what you know well. Then, having saved some time, you will have more time to work on what you DON'T know well.

Typical Exam Break Down by Topic:

1. Measurement (x5)

- Reading of a buret and other graduated devices
- Include uncertainty (the \pm value or estimated digit) in measurement readings

2. Nomenclature i.e. Chemical Naming (x5)

- Ionic compounds
- Covalent compounds
- Acids

3. Balancing equations (x5) where...

- None of the reactants or products has charge
- Reactants and products are given in words
- One of the reactants and one of the products has charge

4. Stoichiometry (x5)

- Convert grams of a compound to moles or units (atoms, molecules, ions) of that compound
- Given a balanced equation, convert grams of compound A to moles or grams of compound B
- Use limiting reactant to calculate theoretical yield
- Use enthalpy of reaction (ΔH) as part of stoichiometry

5. Acid-Base Reactions (x5)

- Acid-Base net ionic equations
- Acid-Base Conjugate Acid-Base pairs
- Given Acid-Base strength tables determine direction or extent of reaction.
- Acid-Base inventory in terms of relative molarity of each species in solution

6. Reduction-Oxidation (RedOx) Reactions (x5)

- Determine Oxidation numbers in order to verify a reduction-oxidation reaction
- Identify Oxidized and Reduced species
- Given Oxidizer-Reducer strength tables determine direction or extent of Redox reaction.

7. Additional Topics (x10)

- Classifications of matter
- Energy: Endothermic versus Exothermic processes
- Ions, elements and compounds
- Electrolytes and Nonelectrolytes
- Bond Polarity

8. Molecular Structures (x10)

- Lewis structures including Isomers
- Formal charge of elements in a Lewis structure
- VSEPR-based 3D Molecular Geometry
- Molecule polarity (due to net dipole)