

CHEMISTRY (CHEM& 161) Placement Test

Who may take the test?	Students who want to place into CHEM& 161. Additionally, students must have passed MATH& 141 or MATH& 148 with a grade of at least 2.0, or received a more advanced placement on the COMPASS math test.
When can I test?	Make an appointment at Student Assessment Services, RSB 76, or by calling 206-768-6767.
How long will the test be?	45 minutes
What is the test format?	Paper/pencil, multiple-choice, 44 questions.
What do I bring?	Government-issued picture ID. Receipt showing payment of the \$17.00 fee. You may bring a non-programmable calculator. No books or references allowed; a periodic table is supplied.
How will I know if I passed?	Students must score at least in the 60 percentile. Come to Student Assessment Services office, RS 76, or see your advisor for score results.
Can I retest?	This is a one-time only test. Review before testing.
How can I prepare?	Review areas of study below and try the sample questions.

Areas of Study:

Chemistry Principles	Kinetics
Structure of Matter	Chemical Thermodynamics
Atomic and Molecular Theory	Oxidation and Reduction
The Elements	Electro-Chemistry
Quantitative Relationship	Periodicity
Nuclear Chemistry	Equilibrium Systems
Aqueous Solution	Qualitative Analysis and Organic Chemistry

California Chemistry Diagnostic Test Sample Questions

Competency areas: Compounds and elements; states of matter; reactions of matter; structure of matter; periodic properties; solutions; qualitative kinetics and thermodynamics; lab skills, mathematical skills. A Periodic Table is provided with the exam.

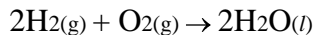
1. The correct formula for aluminum nitrate is

- (a) Al_3N_2 (b) $\text{Al}_3(\text{NO}_3)$ (c) $\text{Al}(\text{NO}_2)_3$ (d) $\text{Al}(\text{NO}_3)_3$

2. A substance releases heat when it changes from

- (a) liquid to solid
- (b) solid to gas
- (c) liquid to gas
- (d) solid to liquid

3. Given the balanced equation:



How many grams of H₂O are formed if 9.00 mol H₂(g) reacts completely with an excess of O₂(g)? The molar mass of H₂O is 18.0g/mol.

- (a) 18.0g
- (b) 36.0g
- (c) 81.0g
- (d) 162g

4. Which element has exactly five electrons in the highest principal energy level (the outer shell)?

- (a) Se
- (b) Ba
- (c) P
- (d) Ge

5. Which element is a metal?

- (a) Se (atomic number = 34)
- (b) Co (atomic number = 27)
- (c) C (atomic number = 6)
- (d) Br (atomic number = 35)

6. What volume of 1.5M NaOH is needed to provide 0.75 mol of NaOH?

- (a) 500L
- (b) 5.0 L
- (c) 500 mL
- (d) 0.75 L

7. For a chemical reaction it is usually found that the reaction rate is faster at higher temperature. The rate increases because

- (a) the concentrations of reactants increase
- (b) more reactants collide with energy equal to or greater than the activation energy
- (c) the concentrations of products increase
- (d) the volume expands and there is more room for new compounds (products) to form

8. Which answer is closest to the true value of the expression:

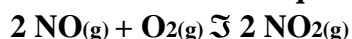
$$(9.1 \times 10^4)(1.1 \times 10^{-5})(\log 10^{-13})(1000)$$

- (a) 1.3
- (b) 13000
- (c) -13000
- (d) 1.3×10^{-11}

9. Which substance does not obey the Lewis octet rule?

- (a) N₂
- (b) NO
- (c) CF₄
- (d) Ar

10. For the reaction at equilibrium:



which change will increase the amount of NO₂(g)?

- (a) remove NO gas
- (b) add NO gas
- (c) add a catalyst
- (d) remove O₂ gas

answers: 1d; 2a; 3d; 4c; 5b; 6c; 7b; 8c; 9b; 10b