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 South's math Placement test.

When can I test?   Come during scheduled other testing; no appointment needed.
See the current Quarterly Testing Schedule for test sessions.

What is the time limit?   45 minutes

What is the test format?   Paper/pencil, multiple-choice, 44 questions.

What do I bring?   Government-issued photo ID.
Receipt showing payment of the $25.00 fee.
No personal calculator allowed; TI-30XIIs is supplied.
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
Structure of Matter
Atomic and Molecular Theory
The Elements
Quantitative Relationship
Nuclear Chemistry
Aqueous Solution

Kinetics
Chemical Thermodynamics
Oxidation and Reduction
Electro-Chemistry
Periodicity
Equilibrium Systems
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
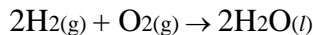thermodynamics; lab skills, mathematical skills. A Periodic Table is provided with the
exam.

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1. **The correct formula for aluminum nitrate is**
(a) Al_3N_2 (b) $Al_3(NO_3)$ (c) $Al(NO_2)_3$ (d) $Al(NO_3)_3$

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:**
$2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$
How many grams of H_2O are formed if 9.00 mol $H_2(g)$ reacts completely with an excess of $O_2(g)$? The molar mass of H_2O 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

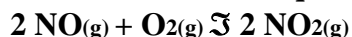8. **Which answer is closest to the true value of the expression:**
$(9.1 \times 10_4)(1.1 \times 10_{-5})(\log 10_{-13})(1000)$
(a) 1.3   (b) 13000   (c) -13000   (d) 1.3 x 10$_{-11}$

9. **Which substance does not obey the Lewis octet rule?**
(a) N_2 (b) NO   (c) CF_4 (d) Ar

10. **For the reaction at equilibrium:**
     $2 NO(g) + O_2(g) \leftrightarrows 2 NO_2(g)$
     which change will increase the amount of $NO_2(g)$?
(a) remove NO gas
(b) add NO gas
(c) add a catalyst
(d) remove O_2 gas

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