

**Suffolk University**  
**Department of Chemistry and Biochemistry**  
**Chemistry Placement Test Information**

**Who has to take the chemistry placement test?**

Any student who wishes to enroll or remain enrolled in CHEM 111 must take the exam. Alternatively, anyone who earns a grade of C or better in CHEM 101 at Suffolk does not have to take the exam.

**When and where is the test given?**

You will take the test during the first meeting of the section of CHEM 111 in which you are enrolled. Be sure to arrive early, because latecomers will not be allowed to work past the stop time. The exam times are

CHEM 111A

12:00 pm – 12:55 pm

Wednesday, September 5

Archer 365

CHEM 111AE

6:50 pm – 7:45 pm

Tuesday, September 4

Archer 462A

CHEM 111B

8:30 am – 9:25 am

Thursday, September 6

Archer 349

**Why do you need to take the exam?**

CHEM 111 is a required course for your major. We want to be sure that your background in chemistry and basic algebra is sufficient for you to succeed in CHEM 111. The test is a measure of your level of understanding of these subjects. **If you do not pass the exam, you will be deregistered from CHEM 111.** We recommend that students who do not pass the exam take one of the sections of CHEM 101. CHEM 101 does not have a prerequisite of high school chemistry, but rather the course provides students a basic background in chemistry. Anyone who earns a grade of C or better in CHEM 101 may enroll in CHEM 111.

CHEM 101A

Tu-Th 8:30 am – 9:45 am

Archer 350

CHEM 101B

Tu-Th 10:00 am – 11:15 am

Archer 349

**What kinds of questions are on the test?**

The test is entirely multiple choice. Bring a scientific calculator, pencils, and an eraser. A periodic table will be provided. The questions on the exam will come from the following topics

- Arithmetic and algebra, including graphing
- Scientific notation and significant figures
- Atomic structure
- Stoichiometry
- Periodic properties
- Chemical formulas and simple nomenclature of compounds and ions
- Mass and mole relationships
- Solutions and solubility
- States of matter and phase changes

- Oxidation-reduction reactions
- Enthalpy
- Gas laws
- Qualitative kinetics, equilibrium, and thermodynamics
- Laboratory skills
- Lewis dot structures
- Molecular geometry
- Chemical bonding

### **How can I prepare for the test?**

You should review the topics listed above. Helpful books to study from are

- *Schaum's Outline of Elementary Algebra* by Barnett Rich and Philip Schmidt
- Your high school chemistry textbook
- A college-level general chemistry textbook
- *Schaum's Easy Outline Beginning Chemistry* by David E. Goldberg and David Goldberg
- Review books, such as Barron's, for the SAT II Chemistry test or the AP Chemistry test

We suggest that you only review the material that you covered in a high-school or other preparatory chemistry course. Attempting to learn this material for the first time just to take the placement exam is not recommended. This may get you through the placement test and into CHEM 111, but you'll most likely struggle in the course.

### **When will you learn your score on the test?**

You will receive the results in an e-mail to your Suffolk e-mail address on Thursday, September 6.

### **Sample exam questions**

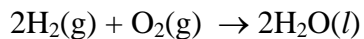
1. The correct formula for aluminum nitrate is

- (a)  $\text{Al}_3\text{N}_2$       (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  $\text{H}_2\text{O}$  are formed if 9.00 mol  $\text{H}_2$  reacts completely with an excess of  $\text{O}_2$ ?  
The molar mass of  $\text{H}_2\text{O}$  is 18.0 g/mol.

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

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

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

5. Solve for x:

$$4x - b = 2x + c$$

- (a)  $c - b - 6$       (b)  $\frac{c+b}{2}$       (c)  $\frac{b+c}{6}$       (d)  $\frac{c-b}{2}$

6. 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)

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

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

8. 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

9. Which answer is closest to the true value for the expression:

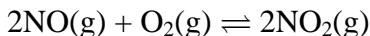
$$(9.1 \times 10^4)(1.1 \times 10^{-5})(\log 10^{-13})(1000)$$

- (a) 1.3
- (b) 13000
- (c) -13000
- (d)  $1.3 \times 10^{-11}$

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

- (a) N<sub>2</sub>
- (b) NO
- (c) CF<sub>4</sub>
- (d) Ar

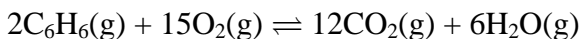
11. For the reaction at equilibrium:



which change will *increase* the amount of NO<sub>2</sub>?

- (a) remove NO gas
- (b) add NO gas
- (c) add a catalyst
- (d) remove O<sub>2</sub> gas

12. For the reaction



the expression for the equilibrium constant, K, is

- (a)  $\frac{[\text{CO}_2][\text{H}_2\text{O}]}{[\text{C}_6\text{H}_6][\text{O}_2]}$
- (b)  $\frac{[\text{CO}_2]^{12}[\text{H}_2\text{O}]^6}{[\text{C}_6\text{H}_6]^2[\text{O}_2]^{15}}$
- (c)  $\frac{[\text{C}_6\text{H}_6][\text{O}_2]}{[\text{CO}_2][\text{H}_2\text{O}]}$
- (d)  $\frac{[12\text{CO}_2][6\text{H}_2\text{O}]}{[2\text{C}_6\text{H}_6][15\text{O}_2]}$

Answers: 1d, 2a, 3d, 4c, 5b, 6b, 7c, 8b, 9c, 10b, 11b, 12b

For more information contact Dr. Steven Patterson, e-mail: spatters@suffolk.edu