

University of Kentucky

Department of Chemistry

READ THESE DIRECTIONS CAREFULLY BEFORE STARTING THE EXAMINATION!

It is *extremely* important that you fill in the answer sheet EXACTLY as indicated, otherwise your test may not be processed; ALL entries are to be made on SIDE 1 of the answer sheet. Use a #2 pencil (or softer); fill in the circles completely and firmly. Erasures must be complete. Use only the following categories:

NAME:	Print your name starting at the first space, LAST NAME first, then a space, followed by your FIRST NAME, then another space, followed by your MIDDLE INITIAL. Fill in the <u>correct</u> circles below your printed name corresponding to the letters of your name; for the spaces, fill in the top blank circle.
STUDENT NUMBER:	This is VERY IMPORTANT! Under IDENTIFICATION NUMBER, put in your 8 DIGIT STUDENT ID NUMBER (do not use the 9 at the beginning of your number) beginning in column A and continuing through column H, column I will be blank, (do NOT use column J at this time); be sure to fill in the correct circles (a common error to be avoided is mistaking "0" for "1").
TEST FORM:	Fill in the "1" blank in the J column under IDENTIFICATION NUMBER (to indicate Hour Examination I).
SPECIAL CODES:	Use for course and section number; in positions K-P write in one of the following: <div style="text-align: center;"> Dr. K. Woodrum 107001, 107002 Dr. F. Bramwell 107003, 107004 Dr. S. Newman 107401 </div>
SIGNATURE:	You MUST sign the examination answer sheet (bubble sheet) on the line directly above your printed name. Use your legal signature.

Answering Questions:

Starting with answer "1" on SIDE 1, fill in the circle indicating the one best answer for each of the 25 questions in this examination. Your score is the sum of the appropriate credit for each response. The day after the examination is finished, an examination key will be posted on Blackboard.

Grading and Reporting:

The examination scores will be posted in Blackboard within 96 hours after the examination. If an error has been made in scoring your answers, tell your instructor within 48 hours of the posting of your score.

BE SURE THAT YOUR TEST HAS 25 QUESTIONS, A PERIODIC TABLE, AND ONE SHEET OF SCRATCH PAPER. You may NOT use your own scratch paper during this examination. Cell phones and pagers are to be turned off and out of sight during the exams.

1. Which of the following **incorrectly** fills in the blank for the sentence below?
Gases _____ than the condensed states of liquids and gases.

- A. are much more compressible C. have much greater distances between molecules
B. have much lower densities D. have much lower molar masses
-

2. Which of the following groups of compounds has the normal boiling points arranged in increasing temperature order?

- A. H_2S , H_2Se , H_2Te , H_2O C. SnH_4 , SiH_4 , GeH_4 , CH_4
B. HF , HCl , HBr , HI D. NH_3 , PH_3 , AsH_3 , SbH_3
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3. Which of these statements correctly describe the reasoning for why ice is less dense than liquid water?

- A. The intermolecular forces of H_2O are too weak to hold the molecules close together.
B. The high viscosity of water doesn't allow it to flow keeping it from forming a dense solid.
C. The rigidity of the organized structure of water when crystallizing doesn't allow for tight packing.
D. This is an unexplained phenomenon.
-

4. Which statement is **true** concerning the simple cubic unit cell?

- A. The cell contains eight atoms. C. The cell only contains lattice points on the corners of the cube.
B. The coordination number is four. D. The lattice points are not shared between unit cells.
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5. Platinum has a cubic crystal structure with an edge length of 392 pm and a density of 21.5 g/cm^3 . How many platinum atoms are there in a unit cell?

- A. 1 C. 4
B. 2 D. 6
-

14. At 20 °C, a liquid solution contains 25.6 g sodium acetate trihydrate in 100 g water. The composition of a saturated solution of sodium acetate trihydrate at 20 °C is 46.5 g sodium acetate trihydrate in 100 g water. The liquid solution is said to be:

- A. Unsaturated
B. Supersaturated
C. Saturated
D. Hyposaturated
-

15. Which of these compounds is likely to be soluble in cyclohexane (C₆H₁₂) and is correctly listed with the intermolecular forces between solute and solvent?

- A. KOH, ion – induced dipole
B. CCl₄, dispersion forces
C. NH₃, hydrogen bonding
D. CO₂, dipole – dipole
-

16. Calculate the molality of a solution prepared by dissolving 25.0 grams of potassium (KNO₃) nitrate in 150.0 grams of water.

- A. 16.7 *m*
B. 1.65 *m*
C. 14.3 *m*
D. 2.95 *m*
-

17. A 2.60 *M* aqueous solution has a density of 1.40 g/mL. The solute's molar mass is 245 g/mol. Assume the density of water is 1.00 g/mL. What is the molality of the solution?

- A. 2.54 *m*
B. 5.08 *m*
C. 2.60 *m*
D. 3.41 *m*
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18. Which of these statements is true of the effects of solute on solution?

- A. A large bulky glucose molecule (C₆H₁₂O₆) will lower the vapor pressure of water less than the same number of moles of NaCl.
B. Because of the connection between vapor pressure and boiling point, both vapor pressure and boiling point increase with the concentration of particles in solution.
C. A nonpolar solute raises the freezing point by increasing the intermolecular forces in the solution.
D. The vapor pressure of a solution is unaffected by the concentration of a solute.
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19. Under which set of conditions will the most oxygen gas dissolve in water?

- A. Low temperature and low pressure of O₂.
B. High temperature and low pressure of O₂.
C. Low temperature and high pressure of O₂.
D. High temperature and high pressure of O₂.
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CHE 107 Exam 1 February 4, 2010																									
Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Correct Answer	D	A	C	C	C	A	B	A	D	A	C	B	C D	A	B	B	D	A	C	A	D	B	A	D	C