

FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

PS-CH

PHYSICAL SETTING/CHEMISTRY

Thursday, January 28, 2010 — 1:15 to 4:15 p.m., only

SCORING KEY AND RATING GUIDE

Directions to the Teacher:

Refer to the directions on page 3 before rating student papers.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site <http://www.emsc.nysed.gov/osa/> and select the link "Examination Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents examination period.

Part A and Part B-1

Allow 1 credit for each correct response.

Part A			Part B-1	
1 2	11 4	21 3	31 3	41 2
2 1	12 4	22 2	32 4	42 1
3 1	13 2	23 3	33 3	43 4
4 3	14 3	24 3	34 2	44 2
5 2	15 1	25 3	35 2	45 1
6 2	16 1	26 1	36 3	46 4
7 1	17 2	27 3	37 1	47 1
8 4	18 1	28 4	38 3	48 4
9 1	19 3	29 2	39 3	49 2
10 1	20 4	30 2	40 1	50 4

Directions to the Teacher

Follow the procedures below for scoring student answer papers for the Physical Setting/Chemistry examination. Additional information about scoring is provided in the publication *Information Booklet for Scoring Regents Examinations in the Sciences*.

Use only *red* ink or *red* pencil in rating Regents papers. Do *not* correct the student's work by making insertions or changes of any kind.

On the detachable answer sheet for Part A and Part B–1, indicate by means of a check mark each incorrect or omitted answer. In the box provided at the end of each part, record the number of questions the student answered correctly for that part.

At least two science teachers must participate in the scoring of each student's responses to the Part B–2 and Part C open-ended questions. Each of these teachers should be responsible for scoring a selected number of the open-ended questions on each answer paper. No one teacher is to score all the open-ended questions on a student's answer paper.

Students' responses must be scored strictly according to the Scoring Key and Rating Guide. For open-ended questions, credit may be allowed for responses other than those given in the rating guide if the response is a scientifically accurate answer to the question and demonstrates adequate knowledge as indicated by the examples in the rating guide. Complete sentences are *not* required. Phrases, diagrams, and symbols may be used. In the student's answer booklet, record the number of credits earned for each answer in the box printed to the right of the answer lines or spaces for that question.

Fractional credit is *not* allowed. Only whole-number credit may be given to a response. Units need not be given when the wording of the questions allows such omissions.

Raters should enter the scores earned for Part A, Part B–1, Part B–2, and Part C on the appropriate lines in the box printed on the answer booklet and then should add these four scores and enter the total in the box labeled "Total Written Test Score." Then, the student's raw score should be converted to a scale score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, January 28, 2010. The student's scale score should be entered in the labeled box on the student's answer booklet. The scale score is the student's final examination score.

All student answer papers that receive a scale score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

Because scale scores corresponding to raw scores in the conversion chart may change from one examination to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score.

Part B–2

Allow a total of 16 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit for $112 \text{ g} \pm 3 \text{ g}$.

52 [1] Allow 1 credit for 7.64 d.

53 [1] Allow 1 credit. Acceptable responses include, but are not limited to:
sublimation

54 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

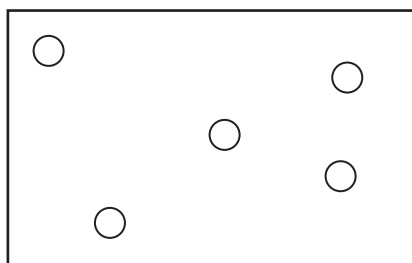
The potential energy of the CO_2 molecules increases.

The $\text{CO}_2(\text{g})$ molecules have more potential energy than the $\text{CO}_2(\text{s})$ molecules.

55 [1] Allow 1 credit.

Example of a 1-credit response:

Key
○ = CO_2 molecule



56 [2] Allow a maximum of 2 credits, allocated as follows:

- Allow 1 credit for a correct numerical setup. Acceptable responses include, but are not limited to:

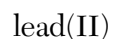
$$388 \text{ ppm} = \frac{\text{grams of LiBr}}{500.0 \text{ g of solution}} \times 1\,000\,000$$

$$\frac{388}{10^6} = \frac{x}{500}$$

- Allow 1 credit for 0.194 g *or* for a response consistent with the student's numerical setup. Significant figures do *not* need to be shown.

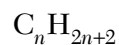
Note: Do *not* allow credit for a numerical setup and calculated result that are not related to the concept assessed by the question.

57 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



58 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

alkane



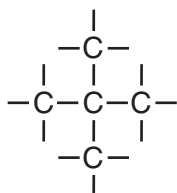
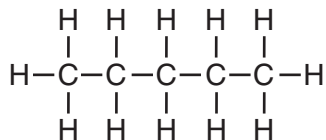
59 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

All of the carbon-carbon bonds are single covalent bonds.

There are only single bonds between the carbon atoms.

60 [1] Allow 1 credit.

Examples of 1-credit responses:



61 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

2-8-8

62 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

1.02×10^{-10} m

0.000 000 000 102 m

63 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A sodium atom loses the electron in its outer shell, causing the radius of the ion to be smaller than the radius of the atom.

An Na atom has three electron shells, but an Na^+ ion has only two electron shells.

64 [1] Allow 1 credit for five *or* 5.

65 [1] Allow 1 credit for +5.

Part C

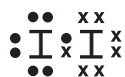
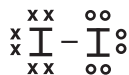
Allow a total of 19 credits for this part. The student must answer all questions in this part.

66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

At STP, the intermolecular forces in I₂ are stronger than in F₂.
weaker intermolecular forces in F₂

67 [1] Allow 1 credit.

Examples of 1-credit responses:



68 [1] Allow 1 credit for 0.5 g.

69 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Magnesium is more active than hydrogen.

H₂ is less active than Mg.

70 [1] Allow 1 credit for _____ Mg(s) + 2 HCl(aq) → _____ H₂(g) + _____ MgCl₂(aq).

Allow credit even if the coefficient “1” is written in front of Mg(s), H₂(g), and/or MgCl₂(aq).

71 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



72 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

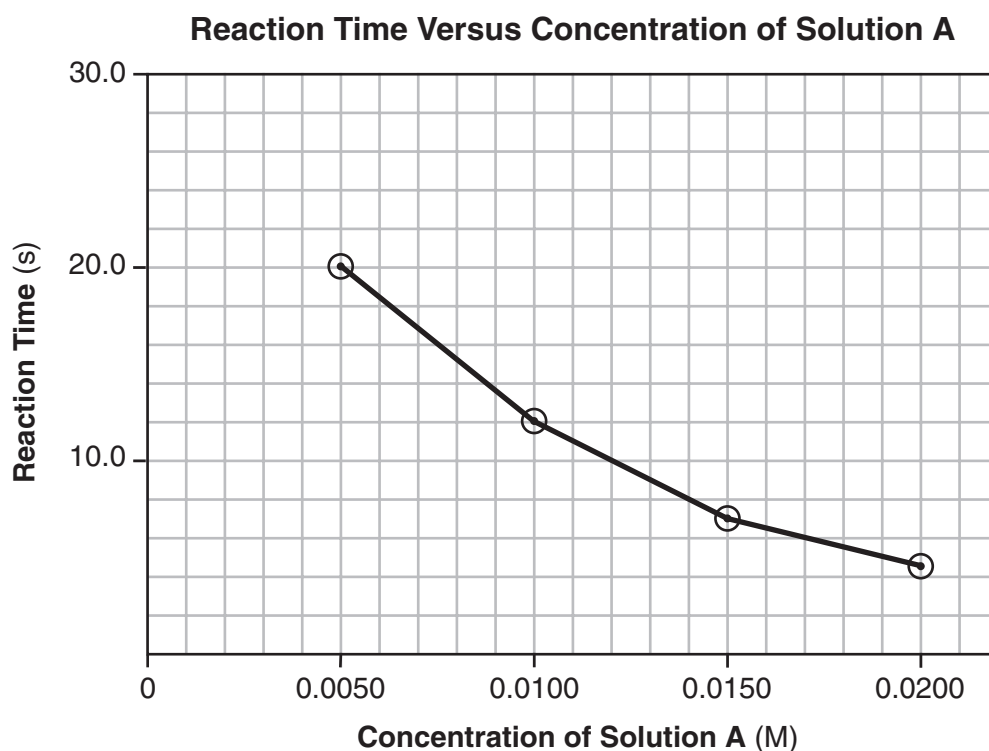
As the concentration of solution A was decreased, the time for the reaction to go to completion increased.

As the concentration of A is decreased, the rate of reaction decreases.

73 [1] Allow 1 credit for marking an appropriate scale on the axis labeled “Reaction Time (s).” An appropriate scale is linear and allows a trend to be seen.

74 [1] Allow 1 credit for correctly plotting all four points ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

Example of a 2-credit response for questions 73 and 74:



75 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

temperature

addition of a catalyst

76 [1] Allow 1 credit for 6 *or* six protons and 8 *or* eight neutrons.

77 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

nonpolar covalent

covalent

a network of covalent bonds

78 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

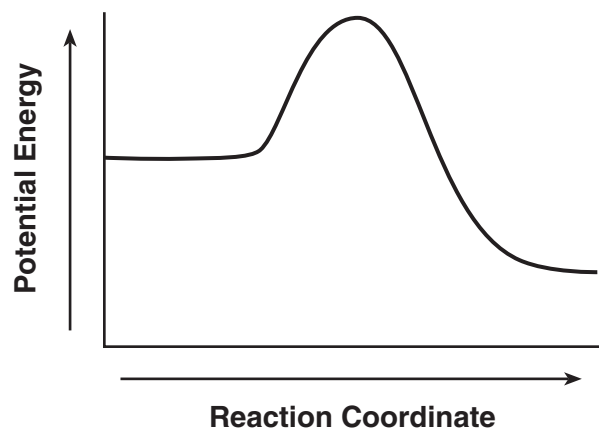
Diamond has atoms bonded strongly in a three-dimensional network. Graphite has atoms that are held weakly between layers.

79 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

combustion

80 [1] Allow 1 credit.

Example of a 1-credit response:



81 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



barium-144

82 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A battery is part of the cell and is providing energy that causes the reaction.

Electricity is used to operate the cell.

83 [1] Allow 1 credit for –2 to 0.

84 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Litmus turns blue when a sufficient amount of hydroxide ions are produced.

The reaction in test tube 2 produces OH^- ions that make this solution basic. Litmus is blue in a basic solution.

Regents Examination in Physical Setting/Chemistry

January 2010

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the January 2010 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Thursday, January 28, 2010. Conversion charts provided for previous administrations of the Regents Examination in Physical Setting/Chemistry must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to www.emsc.nysed.gov/osa/exameval.
2. Select the test title.
3. Complete the required demographic fields.
4. Complete each evaluation question and provide comments in the space provided.
5. Click the SUBMIT button at the bottom of the page to submit the completed form.

Map to Core Curriculum

January 2010 Physical Setting/Chemistry			
Question Numbers			
Key Ideas/Performance Indicators	Part A	Part B	Part C
Standard 1			
Math Key Idea 1		32, 42, 43, 51, 52, 56, 62	68, 73, 74, 78
Math Key Idea 2			72
Math Key Idea 3		31, 32, 36, 40, 43, 52, 56	68, 70, 81, 83
Science Inquiry Key Idea 1		45, 47, 54, 59	75, 77, 78
Science Inquiry Key Idea 2			
Science Inquiry Key Idea 3		31, 34, 38, 39, 47, 50, 53, 54, 57, 59, 61, 63, 65	69, 70, 77, 80, 82, 83, 84
Engineering Design Key Idea 1			
Standard 2			
Key Idea 1			
Key Idea 2			
Key Idea 3			
Standard 6			
Key Idea 1		38, 41	
Key Idea 2			
Key Idea 3			
Key Idea 4			
Key Idea 5			
Standard 7			
Key Idea 1			
Key Idea 2			
Standard 4 Process Skills			
Key Idea 3		33, 34, 35, 36, 37, 39, 40, 42, 43, 44, 46, 48, 50, 51, 55, 56, 58, 60, 64	68, 69, 70, 71, 76, 79, 82, 84
Key Idea 4		44, 49, 52, 54	80, 81
Key idea 5		38, 61	66, 67, 77, 78
Standard 4			
Key Idea 3	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 17, 18, 19, 22, 24, 25, 26, 27, 30	31, 32, 33, 34, 35, 36, 37, 39, 40, 43, 44, 45, 46, 47, 48, 50, 51, 55, 56, 57, 58, 59, 60, 64, 65	68, 69, 70, 71, 72, 73, 74, 75, 76, 79, 82, 83, 84
Key Idea 4	20, 21, 28, 29	41, 42, 49, 52, 53, 54	80, 81
Key Idea 5	11, 12, 13, 14, 15, 16, 23	61, 62, 63	66, 67, 77, 78
Reference Tables			
2002 Edition	1, 2, 4, 7, 8, 12, 13, 15, 26, 27, 29	31, 32, 34, 35, 39, 42, 43, 46, 47, 50, 51, 52, 57, 58, 61, 63	67, 68, 71, 76, 81, 83, 84