

FOR TEACHERS ONLY

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

PS-CH

PHYSICAL SETTING/CHEMISTRY

Wednesday, August 18, 2010 — 12:30 to 3:30 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 4	31 2	41 2
2 3	12 3	22 2	32 2	42 3
3 1	13 3	23 1	33 4	43 2
4 4	14 2	24 1	34 3	44 4
5 2	15 3	25 2	35 4	45 3
6 3	16 3	26 2	36 2	46 4
7 2	17 4	27 4	37 1	47 4
8 1	18 2	28 2	38 4	48 4
9 2	19 4	29 4	39 2	49 3
10 2	20 4	30 2	40 4	50 3

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.

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 Wednesday, August 18, 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. On the front of the student's answer booklet, raters must enter their initials on the lines next to "Rater 1" or "Rater 2."

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 15 credits for this part. The student must answer all questions in this part.

51 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

2-7-5

1-8-5

2-8-3-1

52 [1] Allow 1 credit for a response indicating *one* metal, *one* metalloid, and *one* nonmetal.

Metal: tin *or* Sn *or* lead *or* Pb

Metalloid: silicon *or* Si *or* germanium *or* Ge

Nonmetal: carbon *or* C

53 [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:

$$7.31 \text{ g/cm}^3 = \frac{95.04 \text{ g}}{V}$$

$$\frac{95.04}{7.31}$$

- Allow 1 credit for 13.0 cm³ *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.

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

As atomic number increases, first ionization energy decreases.

First ionization energy decreases.

55 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

A strontium atom in the ground state has two more electron shells than a magnesium atom in the ground state.

An Mg atom has fewer electron shells.

- 56 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

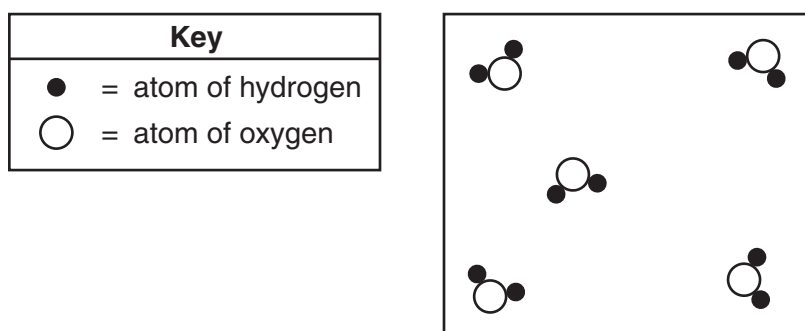
In the ground state, an atom of each element has two valence electrons.

The number of electrons in the outermost shell of each atom is the same.

- 57 [2] Allow a maximum of 2 credits, allocated as follows:

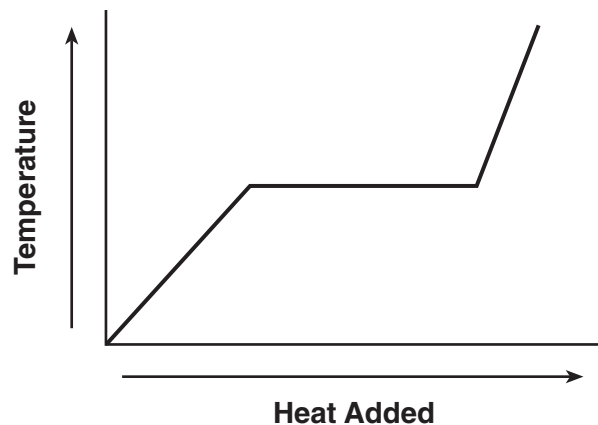
- Allow 1 credit for *at least five* water molecules.
- Allow 1 credit for all the particles drawn to represent the gas phase.

Example of a 2-credit response:



- 58 [1] Allow 1 credit for drawing a line horizontally to represent the phase change and extending the line with a positive slope to represent the gas phase, only.

Example of a 1-credit response:



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

Atoms are mostly empty space.

60 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

Alpha particles are positive and are repelled by the nucleus that is also positive.

Both protons and alpha particles are positively charged so they repel each other.

Protons and alpha particles have the same charge.

61 [1] Allow 1 credit for 188 K. Significant figures do *not* need to be shown.

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

Molecules of CH_4 are nonpolar, but molecules of HCl and H_2O are both polar.

Hydrogen chloride and water are both polar.

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

Ammonia has stronger intermolecular forces than either methane or hydrogen chloride.

Ammonia has hydrogen bonding.

Part C

Allow a total of 20 credits for this part. The student must answer all questions in this part.

- 64 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

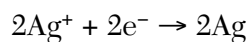
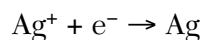


the nickel electrode

Note: Do *not* allow credit for $\text{Ni}^{2+}(\text{aq})$.

- 65 [1] Allow 1 credit for 2.0 mol. Significant figures do *not* need to be shown.

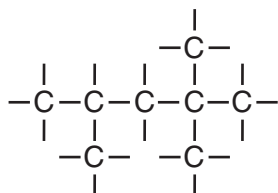
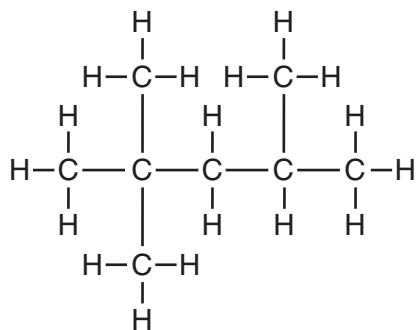
- 66 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



- 67 [1] Allow 1 credit for 92.

- 68 [1] Allow 1 credit.

Examples of 1-credit responses:



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

–OH

alcohol

hydroxyl

Note: Do *not* allow credit for hydroxide or OH[–].

70 [1] Allow 1 credit. Acceptable responses include, but are not limited to:

decomposition

redox

71 [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:

$$3 = \frac{x}{20.0 \text{ g}} \times 100$$

(20)(0.03)

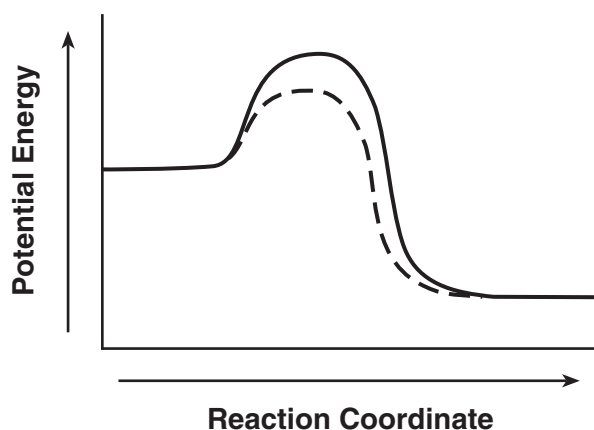
- Allow 1 credit for 0.6 g *or* for a response consistent with the student's numerical setup. Significant figures do *not* need to be shown.

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

72 [1] Allow 1 credit for 34 g/mol. Significant figures do *not* need to be shown.

73 [1] Allow 1 credit.

Example of a 1-credit response:

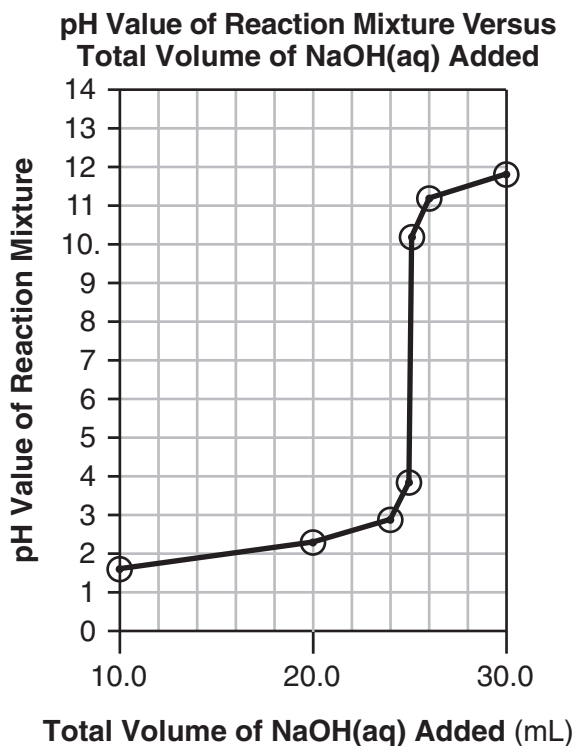


Note: Do *not* allow credit if the potential energy of the reactants or products is changed.

74 [1] Allow 1 credit for a response indicating +2 for carbon in CO and +4 for carbon in CO₂.

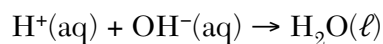
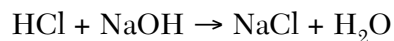
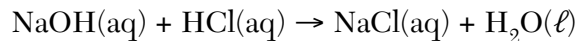
75 [1] Allow 1 credit for correctly plotting all seven points ± 0.3 grid space. Plotted points do *not* need to be circled or connected.

Example of a 1-credit response:



76 [1] Allow 1 credit for $25.0 \text{ mL} \pm 0.6 \text{ mL}$ *or* for a response consistent with the student's graph. Significant figures do *not* need to be shown.

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



78 [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:

$$(M)(40.0 \text{ mL}) = (0.10 \text{ M})(20.0 \text{ mL})$$

$$\frac{(0.1)(20)}{40}$$

- Allow 1 credit for 0.050 M *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.

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

Radon-222 atoms have a complete outer shell of electrons and tend not to bond.

There are eight valence electrons in a radon atom.

octet in valence shell

80 [1] Allow 1 credit. Acceptable responses include, but are not limited to:



Po-210

81 [1] Allow 1 credit for 8.00 mg. Significant figures do *not* need to be shown.

Regents Examination in Physical Setting/Chemistry

August 2010

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

The *Chart for Determining the Final Examination Score for the August 2010 Regents Examination in Physical Setting/Chemistry* will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Wednesday, August 18, 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

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