



AP[®] Chemistry
2004 Sample Student Responses
Form B

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CHEMISTRY

Part B

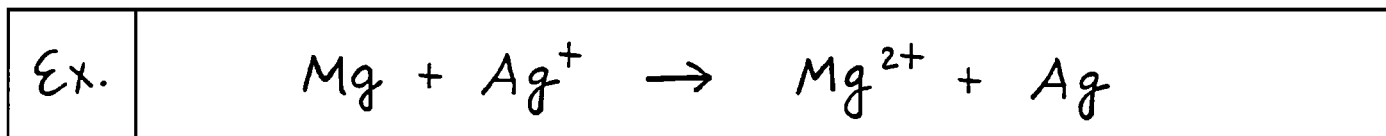
Time—50 minutes

NO CALCULATORS MAY BE USED FOR PART B.

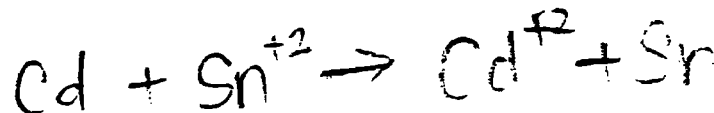
Answer Question 4 below. The Section II score weighting for this question is 15 percent.

4. Write the formulas to show the reactants and the products for any FIVE of the laboratory situations described below. Answers to more than five choices will not be graded. In all cases, a reaction occurs. Assume that solutions are aqueous unless otherwise indicated. Represent substances in solution as ions if the substances are extensively ionized. Omit formulas for any ions or molecules that are unchanged by the reaction. You need not balance the equations.

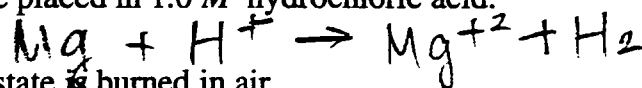
Example: A strip of magnesium is added to a solution of silver nitrate.



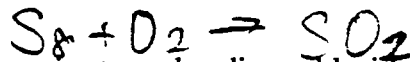
- (a) Cadmium metal is placed in a solution of tin(II) chloride.



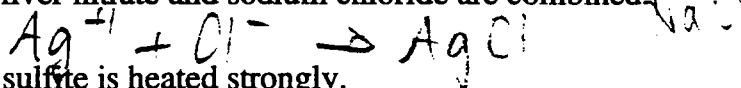
- (b) Magnesium pellets are placed in 1.0 M hydrochloric acid.



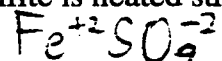
- (c) Sulfur in its standard state is burned in air.



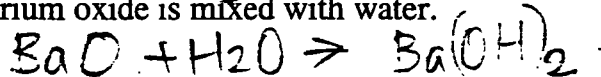
- (d) Solutions of silver nitrate and sodium chloride are combined.



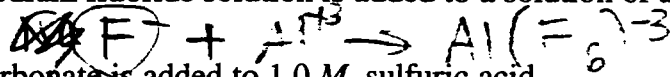
- (e) Solid iron(II) sulfite is heated strongly.



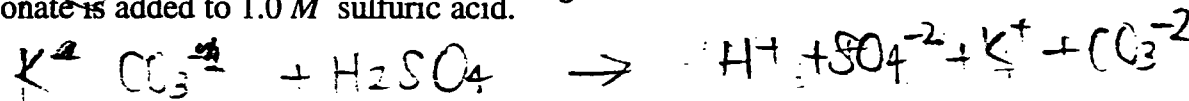
- (f) Powdered barium oxide is mixed with water.



- (g) Excess saturated sodium fluoride solution is added to a solution of aluminum sulfate.



- (h) Solid potassium carbonate is added to 1.0 M sulfuric acid.



WRITE YOUR ANSWERS IN THE BOXES PROVIDED ON THE NEXT PAGE. YOU MAY USE THE SPACE ABOVE EACH BOX FOR SCRATCHWORK.

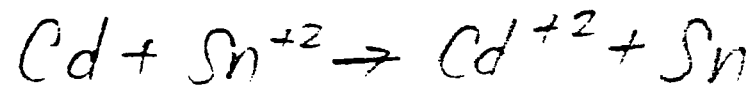
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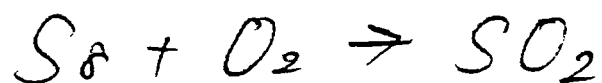
4A₂

**USE THIS PAGE FOR ANSWERS.
PLEASE WRITE THE LETTER FOR THE ANSWER IN THE
LEFT END OF EACH BOX. ONLY THE ANSWERS**

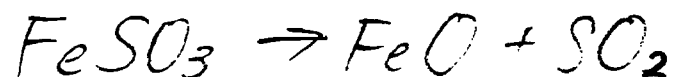
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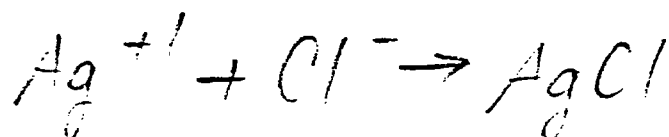
c



e



d



f



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CHEMISTRY

Part B

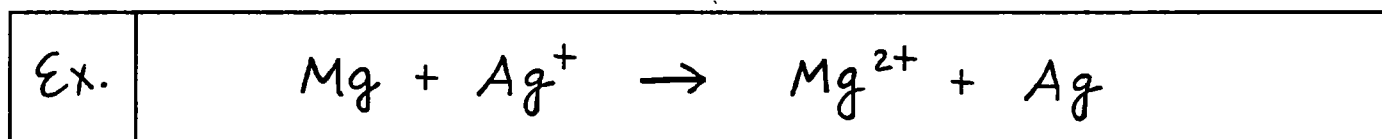
Time—50 minutes

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Answer Question 4 below. The Section II score weighting for this question is 15 percent.

4. Write the formulas to show the reactants and the products for any FIVE of the laboratory situations described below. Answers to more than five choices will not be graded. In all cases, a reaction occurs. Assume that solutions are aqueous unless otherwise indicated. Represent substances in solution as ions if the substances are extensively ionized. Omit formulas for any ions or molecules that are unchanged by the reaction. You need not balance the equations.

Example: A strip of magnesium is added to a solution of silver nitrate.



- ✓ (a) Cadmium metal is placed in a solution of tin(II) chloride.

$$\text{Cd} + \text{Sn}^{2+} \rightarrow \text{Sn} + \text{Cd}^{2+}$$
- ✓ (b) Magnesium pellets are placed in 1.0 M hydrochloric acid.

$$\text{Mg} + \text{H}^+ + \text{Cl}^- \rightarrow \text{Mg}^{2+} + \text{Cl}_2 + \text{H}^+$$
- (c) Sulfur in its standard state is burned in air.

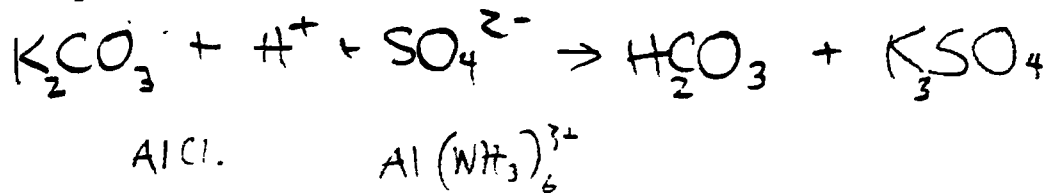
$$\text{S} + \text{O}_2 \rightarrow \text{SO}_2$$
- ✓ (d) Solutions of silver nitrate and sodium chloride are combined.

$$\text{Ag}^+ + \text{Cl}^- \rightarrow \text{AgCl (s)}$$
- (e) Solid iron(II) sulfite is heated strongly.

$$\text{FeSO}_3 \rightarrow \text{FeO} + \text{SO}_2$$
- ✓ (f) Powdered barium oxide is mixed with water.

$$\text{BaO} + \text{H}_2\text{O} \rightarrow \text{Ba}^{2+} + \text{OH}^-$$
- (g) Excess saturated sodium fluoride solution is added to a solution of aluminum sulfate.

$$\text{Na}^+ + \text{F}^- + \text{Al}^{3+} + \text{SO}_4^{2-} \rightarrow \text{AlF}_3$$
- (h) Solid potassium carbonate is added to 1.0 M sulfuric acid.



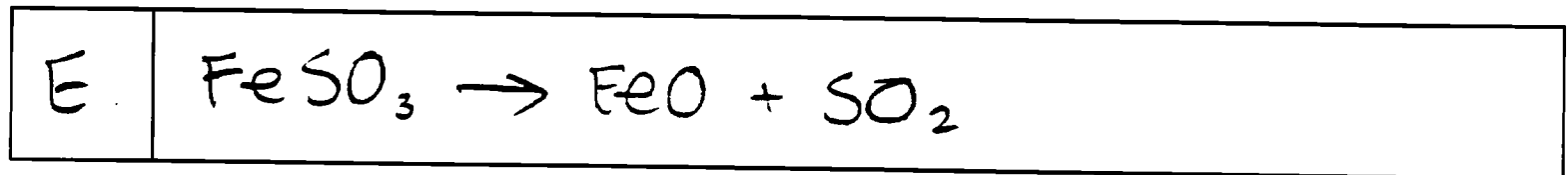
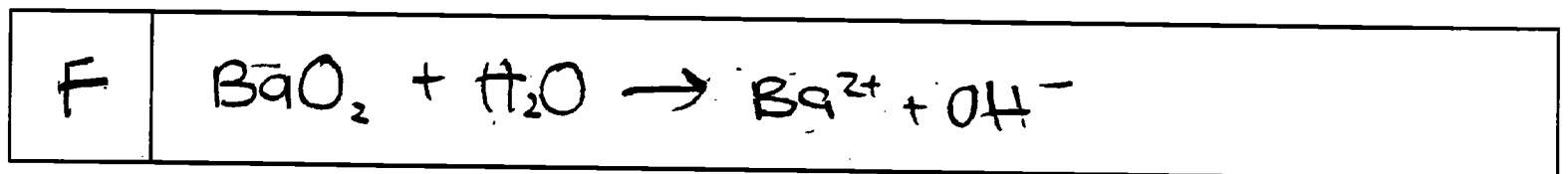
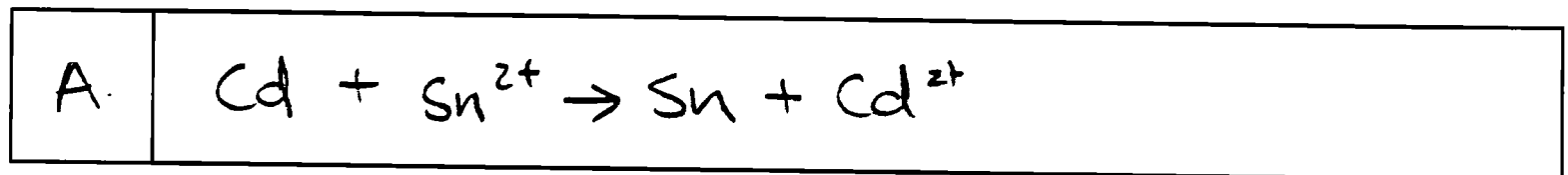
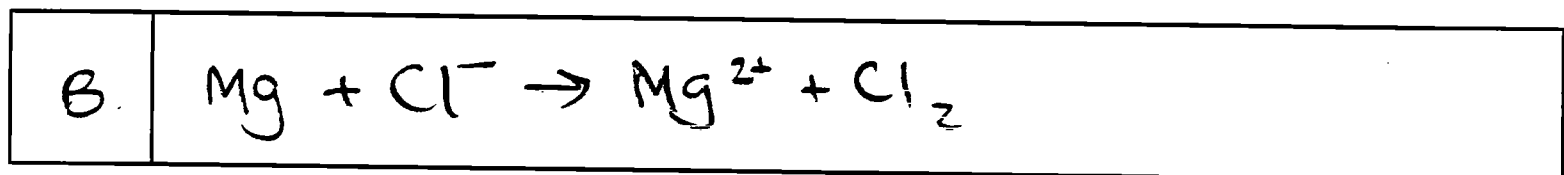
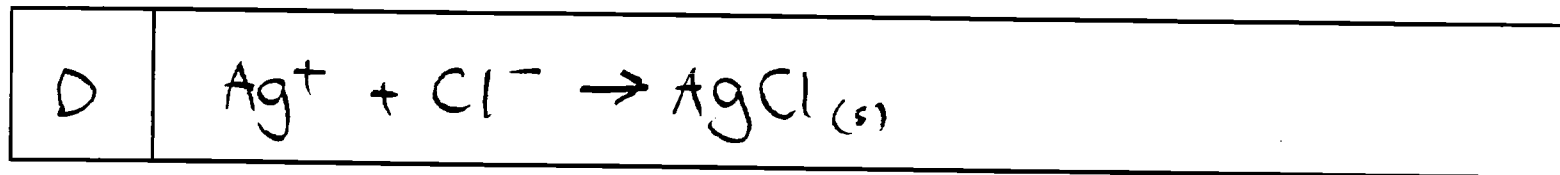
WRITE YOUR ANSWERS IN THE BOXES PROVIDED ON THE NEXT PAGE. YOU MAY USE THE SPACE ABOVE EACH BOX FOR SCRATCHWORK.

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4B₂

USE THIS PAGE FOR ANSWERING QUESTION 4.
PLEASE WRITE THE LETTER FOR THE REACTION IN THE SQUARE AT THE
LEFT END OF EACH BOX. ONLY THE ANSWERS IN THE BOXES WILL BE SCORED.



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CHEMISTRY

Part B

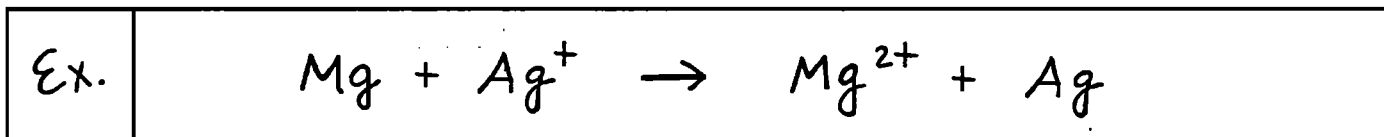
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Example: A strip of magnesium is added to a solution of silver nitrate.



- (a) Cadmium metal is placed in a solution of tin(II) chloride.
 $Cd + PbCl_2 \rightarrow Cd + Pb^{2+} + Cl^-$
- (b) Magnesium pellets are placed in 1.0 M hydrochloric acid.
 $Mg + HCl \rightarrow Mg^{2+} + OH^-$
- (c) Sulfur in its standard state is burned in air.
 $S_8 + O_2 \rightarrow SO_2$
- (d) Solutions of silver nitrate and sodium chloride are combined.
 $AgNO_3 + NaCl \rightarrow Ag^+ + NO_3^- + Na^+ + Cl^-$
- (e) Solid iron(II) sulfite is heated strongly.
 $FeSO_3 \xrightarrow{\Delta} Fe^{2+} + SO_3^{2-}$
- (f) Powdered barium oxide is mixed with water.
 $BaO + H_2O \rightarrow Ba(OH)_2$
- (g) Excess saturated sodium fluoride solution is added to a solution of aluminum sulfate.
 $NaF + Al_2(SO_4)_3 \rightarrow Na^+ + F^- + Al^{3+} + SO_4^{2-}$
- (h) Solid potassium carbonate is added to 1.0 M sulfuric acid.
 $K_2CO_3 + H_2SO_4 \rightarrow K^+ + CO_3^{2-} + H^+ + SO_4^{2-} \rightarrow CO_2 + H_2O + AlF_3$

WRITE YOUR ANSWERS IN THE BOXES PROVIDED ON THE NEXT PAGE. YOU MAY USE THE SPACE ABOVE EACH BOX FOR SCRATCHWORK.

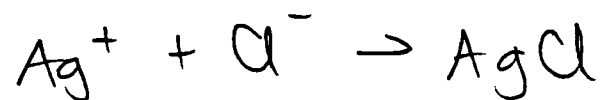
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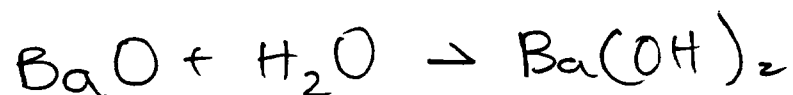
4C₂

**USE THIS PAGE FOR ANSWERING QUESTION 4.
PLEASE WRITE THE LETTER FOR THE REACTION IN THE SQUARE AT THE
LEFT END OF EACH BOX. ONLY THE ANSWERS IN THE BOXES WILL BE SCORED.**

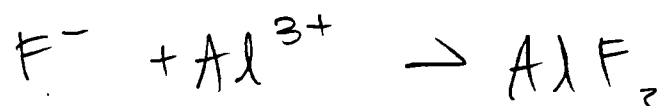
D



F



G



H



B



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