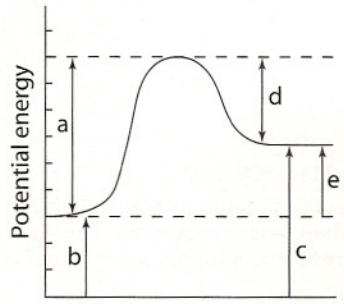
38.



f. The reaction is endothermic because the potential energy of the reactants is less than the potential energy of the products.

39. Heat of reaction equals the potential energy of the products minus the potential energy of the reactants. For an endothermic reaction, the potential energy of the products is greater. For an exothermic reaction, the potential energy of the reactants is greater.

40. Decrease heat, increase pressure, and increase concentration of N_2 and H_2.

41. Examples of organized things might include a made-up bed or food placed in order on shelves. Their entropy is low because the degree of organization is high. Things not well organized include dishes placed randomly in the sink or a closet where things are stored with no organization. The entropy is high because the objects are random.

Topic 9 Answers

Review Questions

1. 1	15. 1	29. 1
2. 2	16. 3	30. 3
3. 4	17. 3	31. 2
4. 4	18. 4	32. 1
5. 3	19. 1	33. 3
6. 1	20. 2	34. 3
7. 4	21. 4	35. 2
8. 2	22. 2	36. 4
9. 1	23. 3	37. 3
10. 2	24. 1	38. 1
11. 2	25. 2	39. 3
12. 1	26. 1	40. 1
13. 2	27. 3	41. 4
14. 2	28. 2	

Questions for Regents Practice

Part A

1. 4	5. 1	9. 4
2. 4	6. 1	10. 1
3. 3	7. 3	11. 3
4. 3	8. 2	12. 2

Part B

13. 4	19. 4	25. 4
14. 2	20. 2	26. 1
15. 1	21. 4	27. 1
16. 3	22. 3	28. 3
17. 2	23. 2	29. 1
18. 4	24. 4	30. 1

Part C

31. (a) +6 (b) +4 (c) −2

32. $3e^-$

33. $Fe^{3+} + 3e^- \rightarrow Fe^0$

34. $X = 5e^-$

35. $X = Cl_2$

36. Diagrams should include a switch and a voltmeter between the two wires and a salt bridge connecting the two solutions.

37. (a) Answers should include a metal and an ion of a metal below it in the series, such as Mg and Fe^{2+}.
(b) Answers should include a metal and an ion of a metal above it in the series, such as Fe and Mg^{2+}.

38. Answers will vary, but might include that electronegativity tends to increase going down the series.

39. At the cathode, metal ions will be reduced, and the metal will plate on the electrode. At the anode, the metal making up the electrode will be oxidized and will decrease in mass as its ions enter solution.

40. The source of the H_2 would be reduction of the H^+ ions present in the sulfuric acid. In general, no other gas is produced, but minute amounts of SO_2, SO_3, or water vapor might be produced.

Topic 10 Answers

Review Questions

1. 2	6. 4	11. 4
2. 1	7. 1	12. 1
3. 1	8. 3	13. 1
4. 2	9. 2	
5. 4	10. 2	

14. chlorate

15. (a) hydrosulfuric acid (b) hydrobromic acid (c) lithium hydroxide (d) magnesium hydroxide

16. An electrolyte could also be a base or a salt. One test would be to add an indicator and note the color.

17. 4	24. 1	31. 2
18. 1	25. 4	32. 3
19. 2	26. 4	33. 4
20. 4	27. 1	34. 1
21. 1	28. 4	35. 4
22. 4	29. 1	36. 3
23. 4	30. 4	

37. (a) hydrofluoric acid (b) hydroselenic acid (c) hydroiodic acid

38. (a) $Ca + 2HCl \rightarrow CaCl_2 + H_2$ (b) $Zn + 2HNO_3 \rightarrow Zn(NO_3)_2 + H_2$ (c) $Pb + H_2CO_3 \rightarrow PbCO_3 + H_2$ (d) $2Al + 6CH_3COOH \rightarrow 2Al(CHCOO)_3 + 3H_2$ (e) no reaction

39. (a) $NaOH + HNO_3 \rightarrow H_2O + NaNO_3$, sodium nitrate (b) $Mg(OH)_2 + HNO_3 \rightarrow H_2O + Mg(NO_3)_2$, magnesium nitrate (c) $Mg(OH)_2 + H_2SO_4 \rightarrow 2H_2O + MgSO_4$, magnesium sulfate (d) $2KOH + H_2SO_4 \rightarrow 2H_2O + K_2SO_4$, potassium sulfate (e) $3LiOH + H_3PO_4 \rightarrow 3H_2O + Li_3PO_4$, lithium phosphate (f) $3Ca(OH)_2 + 2H_3PO_4 \rightarrow 6H_2O + Ca_3(PO_4)_2$, calcium phosphate