

# Workbook

# Surviving Chemistry

## One Concept at a Time

*A Workbook for high school chemistry*

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## **Surviving Chemistry: One Concept at a Time Workbook**

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# Table of Contents

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## Worksheets

### Topic 1: Matter and Energy

Pg 1 - 10

Worksheet 1 : Types of matter  
Worksheet 2: Phases of matter, energy, and Temperature  
Worksheet 3: Heat and Heat calculations  
Worksheet 4: Characteristics of gases and gas law calculations

### Topic 2: The Periodic Table

Pg 11 - 16

Worksheet 5: Types of Elements and their properties  
Worksheet 6: Classifying the Elements  
Worksheet 7: Periodic Trends

### Topic 3: The Atomic Structures

Pg 17 - 26

Worksheet 8: Historical development of atom  
Worksheet 9: The atomic structures  
Worksheet 10: Atomic mass calculations  
Worksheet 11: Bohr's atomic model and electron configurations  
Worksheet 12: Neutral atoms and ions

### Topic 4: Chemical Bonding

Pg 27 - 36

Worksheet 13: Chemical bonding, stability of atoms, and energy  
Worksheet 14: Bonding between atoms (intermolecular forces)  
Worksheet 15: Types of substances and their properties  
Worksheet 16: Molecular structures, molecular shapes, and molecular polarity  
Worksheet 17: Lewis electron-dot diagrams

### Topic 5: Chemical Formulas and Equations

Pg 37 - 44

Worksheet 18: Chemical formulas  
Worksheet 19: Writing and naming formulas  
Worksheet 20: Chemical equations

### Topic 6: Moles: Mathematics of Formulas and Equations

Pg 45 - 52

Worksheet 21: Mole calculations in formulas  
Worksheet 22: Percent composition calculations  
Worksheet 23: Mole – mole calculations in equations

# Table of Contents

---

## Topic 7: Solutions

Pg 53 – 62

Worksheet 24: Solubility factors  
Worksheet 25: Types of solutions  
Worksheet 26: Molarity and parts per million calculations  
Worksheet 27: Vapor pressure  
Worksheet 28: Effect of solute on boiling and freezing points

## Topic 8: Acids, Bases and Salts

Pg 63 – 70

Worksheet 29: Terms and definitions  
Worksheet 30: Properties of acids and bases  
Worksheet 31: Reactions of acids and bases  
Worksheet 32: Titration  
Worksheet 33: Relating H<sup>+</sup> concentration to pH  
Worksheet 34: Naming and writing formula of acids

## Topic 9: Kinetics and Equilibrium

Pg 71 – 82

Worksheet 35: Rate of reactions  
Worksheet 36: Energy and chemical reactions  
Worksheet 37: Potential energy diagrams  
Worksheet 38: Equilibrium and Le Chatelier's principle

## Topic 10: Organic Compounds

Pg 83 - 96

Worksheet 39: Properties of organic compounds  
Worksheet 40: Hydrocarbon compounds  
Worksheet 41: Functional group compounds  
Worksheet 42: Classes of organic compounds  
Worksheet 43: Drawing organic structures  
Worksheet 44: Isomers  
Worksheet 45: Organic reactions

## Topic 11: Redox and Electrochemistry

Pg 97 – 110

Worksheet 46: Oxidation numbers  
Worksheet 47: Redox equation, half-reaction equations  
Worksheet 48: Interpreting redox equations  
Worksheet 49: Balancing redox equations  
Worksheet 50: Electrochemistry- Definitions and facts  
Worksheet 51: Electrochemical cells

## Topic 12: Nuclear Chemistry

Pg 111 – 116

Worksheet 52: Definition and facts of nuclear chemistry  
Worksheet 53: Nuclear transmutations and equations  
Worksheet 54: Half-life calculations and Reference Table N

## Table of Contents

### Multiple Choice Questions

Pg 117 - 359

Topic 1: Matter and Energy	Topic 7: Solutions
Topic 2: The Periodic Table	Topic 8: Acids, Bases and Salts
Topic 3: The Atomic Structure	Topic 9: Kinetic and Equilibrium
Topic 4: Chemical Bonding	Topic 10: Organic Chemistry
Topic 5: Chemical Formulas and Equations	Topic 11: Redox and Electrochemistry
Topic 6: Moles calculations	Topic 12: Nuclear Chemistry

### Constructed Response Questions

Pg 360 - 415

Topic 1: Matter and Energy	Topic 7: Solutions
Topic 2: The Periodic Table	Topic 8: Acids, Bases and Salts
Topic 3: The Atomic Structure	Topic 9: Kinetic and Equilibrium
Topic 4: Chemical Bonding	Topic 10: Organic Chemistry
Topic 5: Chemical Formulas and Equations	Topic 11: Redox and Electrochemistry
Topic 6: Mole calculations	Topic 12: Nuclear Chemistry

### Reference Table Questions

Pg 416 - 429

Table A : Standard Temperature and Pressure
Table B: Physical Constants for Water
Table C: Selected Prefixes
Table D: Selected Units
Table E: Selected Polyatomic Ions
Table F: Solubility Guidelines
Table G: Solubility Curves
Table H: Vapor Pressure of Four Liquids
Table I: Heat of reactions at 101.3 KPa and 298 K
Table J: Activity Series
Table K: Common Acids
Table L: Common Bases
Table M: Common Acid-Base Indicators
Table N: Selected Radioisotopes
Table O: Symbols Used in Nuclear Chemistry
Table P: Organic Prefixes
Table Q: Homologous Series of Hydrocarbon
Table R: Organic Functional Groups
Table S: Properties of Selected Elements
Table T: Formulas and Equations

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# **Worksheets**

*Concept by Concept*

**Set A: Terms and Definitions**

*Objective: By defining these words, you should become more familiar with Periodic Table related terms and their definitions*

***Define, neatly and clearly, the following Periodic Table related terms.***

1. Periodic Law
2. Group
3. Period
4. Metal
5. Nonmetal
6. Metalloid
7. Alkali metal
8. Alkaline earth metal
9. Transition element
10. Halogen
11. Noble gas
12. Malleable
13. Luster
14. Brittleness
15. Ionization energy
16. Electronegativity
17. Atomic radius

## Set B: Properties Metal, metalloid, and nonmetals

*Objective: To your knowledge of properties of the three types of elements*

Write in the space "**metals**" "**metalloids**" or "**nonmetals**" to indicate which the type of element each statement is describing.

- |  |           |
|--|-----------|
| 18. Located to the right of the Periodic Table.                      | 18. _____ |
| 19. Located to the left of the Periodic Table.                       | 19. _____ |
| 20. Located along the zigzag line of the Periodic Table.             | 20. _____ |
| 21. Majority of the elements.  | 21. _____ |
| 22. Gain electrons to form negative ions.                            | 22. _____ |
| 23. Solid may have luster, and is brittle.                           | 23. _____ |
| 24. Solids are malleable   | 24. _____ |
| 25. Tend to have low ionization energy                               | 25. _____ |
| 26. Tend to lose electrons and form positive ions.                   | 26. _____ |
| 27. Have elements in the solid, liquid, and gas phases at STP .      | 27. _____ |
| 28. Elements only exist as solids at STP.                            | 28. _____ |
| 29. Have elements in the solid and in the liquid phase at STP.       | 29. _____ |
| 30. Tend to have high ionization energy.                             | 30. _____ |
| 31. Ionic size (radius) is generally smaller than the atomic size.   | 31. _____ |
| 32. Are good electrical and heat conductor.                          | 32. _____ |
| 33. Are ductile.   | 33. _____ |
| 34. Are poor electrical and poor heat conductor.                     | 34. _____ |
| 35. Atomic radius (size) is generally smaller than the ionic radius. | 35. _____ |
| 36. Solids are generally brittle.                                    | 36. _____ |
| 37. Tend to have high electronegativity value.                       | 37. _____ |
| 38. Have luster.   | 38. _____ |
| 39. Tend to have low electronegativity values.                       | 39. _____ |



## Set C: Properties of Group

**Objective:** To test your knowledge of properties related to groups of the elements

Write in the space provided: "**alkali metals**", "**alkaline earth metals**", "**transition metals**", "**Group 13**" "**halogens**", "**noble gases**" to indicate which group of the elements each statement is describing.

40. Elements form oxide compounds with a general formula of MO. 40. \_\_\_\_\_
41. Elements tend to form compounds that can produce colored solution. 41. \_\_\_\_\_
42. Elements all have full valance shell. 42. \_\_\_\_\_
43. Elements are the most reactive of all metals. 43. \_\_\_\_\_
44. Elements include the most reactive nonmetal 44. \_\_\_\_\_
45. Elements tend to have multiple positive oxidation number. 45. \_\_\_\_\_
46. Elements form oxide compound with a general formula of X<sub>2</sub>O. 46. \_\_\_\_\_
47. Elements form oxide compounds with a general formula of L<sub>2</sub>O<sub>3</sub> 47. \_\_\_\_\_
48. Elements exist as monatomic gases. 48. \_\_\_\_\_
49. Elements generally form +3 ions during bonding 49. \_\_\_\_\_
50. Elements all have two electrons in their valance shell. 50. \_\_\_\_\_
51. Elements always form a negative one (-1) charge ion. 51. \_\_\_\_\_
52. Elements all have seven valance electrons. 52. \_\_\_\_\_
53. Elements form compounds with Group 1 elements with a general formula of XY. 53. \_\_\_\_\_
54. Elements are obtained from electrolytic reduction of fused salt. 54. \_\_\_\_\_
55. Elements neither gain nor lose electrons. 55. \_\_\_\_\_
56. Elements exist mostly as diatomic molecules. 56. \_\_\_\_\_
57. Elements combine with Group 17 elements in a ratio of 1 : 2. 57. \_\_\_\_\_
58. Elements always form a +2 ion when combined with other atoms. 58. \_\_\_\_\_
59. Elements combine with oxygen in a ratio of 1 : 1. 59. \_\_\_\_\_
60. Elements are stable and rarely form compounds. 60. \_\_\_\_\_

**Set A: Classifying elements**

*Objective: To test your ability to determine types of element .*

**Below, symbols of elements are given. Check one or more columns that each element is classified as.**  
*metal nonmetal metalloid alkali alkaline transition halogen noble gas monatomic diatomic*

1. Sb												
2. Sr												
3. Rn												
4. P												
5. Pt												
6. Cs												
7. S												
8. Fe												
9. Br												
10. Ar												

**Set B: Properties of elements**

*Objective: To test your ability to determine properties of a given element*

**Symbols of elements are given below. Check one or more columns of properties that best describe each element.**

	Physical properties			Conductivity		Ionization energy		electronegativity		Lose or gain e-		
	<i>luster</i>	<i>malleable</i>	<i>ductile</i>	<i>brittle</i>	<i>good</i>	<i>poor</i>	<i>low</i>	<i>high</i>	<i>low</i>	<i>high</i>	<i>lose</i>	<i>gain</i>
11. C												
12. Ag												
13. Mg												
14. I												
15. S												
16. Au												

**Set A: Data and Graphing for Group 2 Alkaline Earth Metals:**

**Objective:** To observe trends by plotting and graphing data

Using Reference Table S, Complete the tables below for the Group 2 Alkali Earth metals..  
Once done, scale, plot and graph the data on the graphing grids to observe trends of the four properties.

**Group 2: Alkaline Earth Metals. List Elements in order from Top to Bottom**

Atomic Number	Elements Symbol	Electronegativity	Ionization energy	Atomic Radius (pm)	Melting Point (K)

*Trend in Electronegativity*

Electronegativity Value


Atomic Numbers

*Trend in Ionization Energy*

Ionization energy (KJ/mol)


Atomic Numbers

*Trend in Atomic Radius (size)*

Atomic Radius (pm)


Atomic Numbers

*Trend in Melting Point*

Melting Point (K)

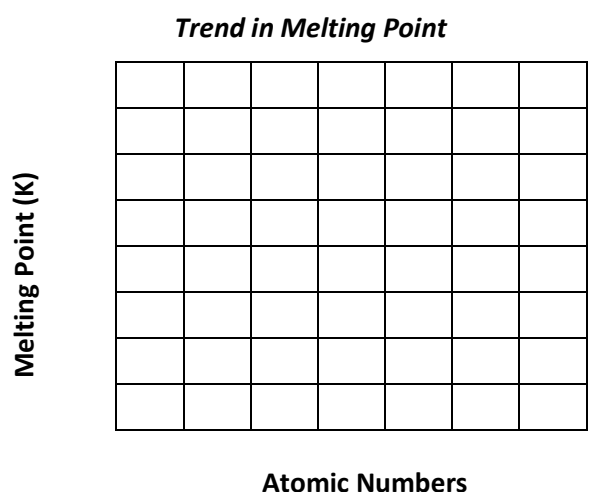
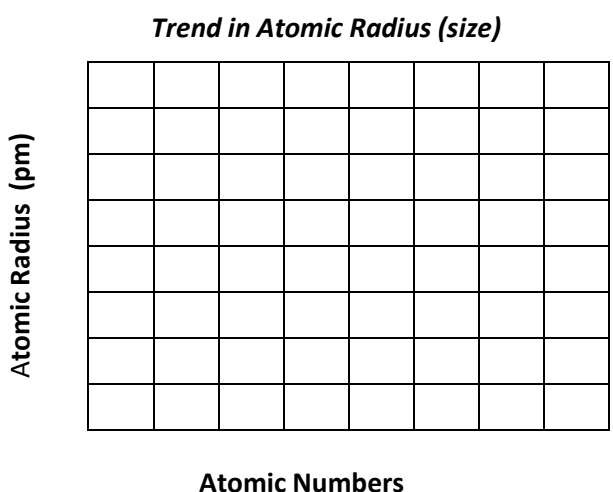
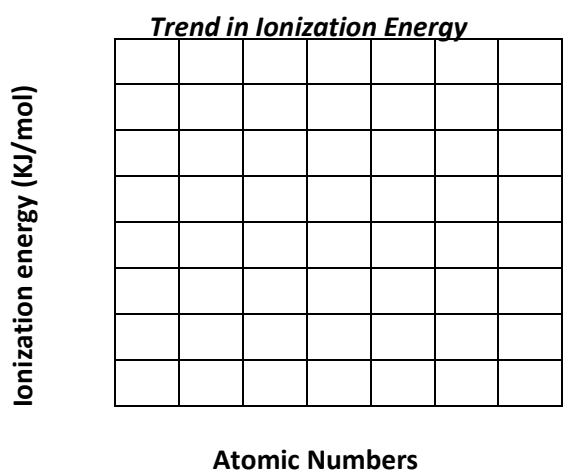
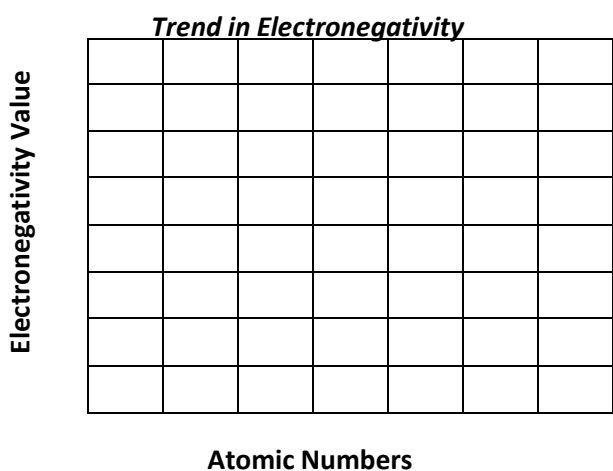

Atomic Numbers

**Set B: Data and Graphing for Period 2 Elements**

Using Reference Table S, Complete the table below for Period 2 Elements.  
Once done, plot and graph the data on the graphing grids to observe trends of the four properties.

**Period 2 Elements** List Elements in order from Left to Right

Atomic Number	Elements Symbol	Electronegativity	Ionization energy	Atomic Radius (pm)	Melting Point (K)



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