

Coordination of National Science Education Standards (NSES) With MicroChem Kits LLC Manual And Kit

Science Content Standards: 9-12

CONTENT STANDARD A

DEVELOPING STUDENT ABILITIES AND UNDERSTANDING

All of the MicroChem Kit activities are hands-on laboratory experiments. Students actively participate in investigations that use manipulative skills and illustrate scientific concepts. These activities often require the collection, analysis of data, and interpretation of the data.

CONTENT STANDARD B

GUIDE TO THE CONTENT STANDARD

This section includes many concepts that are directly related to chemistry. The table below shows the coordination of the material in the MicroChem Kit with the sections on STRUCTURE OF ATOMS, the STRUCTURE AND PROPERTIES OF MATTER, and CHEMICAL REACTIONS.

MicroChem Kit Activity	Pertinent words or phrases from NSES
1. Chromatography	“matter is made of atoms”, “atoms may be bonded together to form molecules”.
2. Melting Points, Super cooling	“solids differ in the energy that binds them together”, “atoms may bond together into crystalline solids”, “carbon atoms can bond to one another in chains.
3. Electrical Conductivity of Several Solutions	“bonds between atoms are created when electrons are shared or transferred”,
4. Mole Ratios	“atoms interact with one another by transferring or sharing electrons”, “outer electrons govern the chemical properties of an element”
5. Double Replacement Reactions	“atoms interact with one another by transferring or sharing electrons”
6. Oxidation-Reduction	“oxidation-reduction”
7. Decomposition	“chemical reactions may release or consume energy”
8. Boyle’s Law	“gas molecules move almost independently of each other”
9. Charles’s Law	“gas molecules move almost independently of each other”
10. Solubility Product Constant	“many reactions involve transfer of electrons”
11. PH and PH Indicators	“acid-base reaction”
12. A Microscale Titration	“acid-base reaction”
13. Molar Mass by Titration	“atoms interact with one another by transferring or sharing electrons”, “acid-base reaction”
14. A Buffer Solution	“many reactions involve transfer of electrons”
15. Reaction Rates: The Effect of Concentration	“reaction rates depend on how often reaction molecules encounter one another”, “catalysts accelerate reactions”
16. Reaction Rates: The Effect of Temperature	“reaction rates depend on temperature”, “catalysts accelerate reactions”
17. Electrochemistry: Galvanic Cells	“atoms interact with each other by transferring electrons”, “chemical reactions release or consume energy”