

Testable learning outcomes for CHEM 4 – Exam #1

The slide numbers listed below correspond to those on the posted **PowerPoint slides**. For various reasons, they might not necessarily match the **recorded lectures**.

1) Section 3.1-3.6, 4.1-4.1 – Matter and Atoms (Wednesday, September 2)

- a) Know the definitions/terms on the clicker questions. [Slide 4]
- b) Be able to determine if something is an example of “matter”. [Slides 5 – 7]
- c) Understand why chemists use categories to classify matter. Be able to give examples of different classification schemes that chemists use. [Slides 8-10]
- d) Be able to categorize properties as “physical” or “chemical”. [Slides 15 – 16]
- e) **Not responsible for:** Other states of matter. [Slides 11 – 14]

2) Section 4.6 (Friday, September 4)

- a) Know the definitions/terms on any of the clicker questions. [Slides 3, 5, and 20]
- b) Know how scientists distinguish between “heterogenous mixtures”, “homogenous mixtures”, “compounds”, and “elements”. [Slides 6 – 8, and 10]
- c) Know basic information about the elements. [Slides 12 – 13]
- d) Be able to discuss how the original periodic table was made. [Slide 15]
- e) Know the information about the modern periodic table and how elements are added. [Slide 16]
- f) Know the basic idea behind how scientists use supercolliders to create new elements. [Slide 19]
- g) Be able to use a periodic table to identify: groups/periods, whether something is a metal/metalloid/non-metal, names given to specific parts of the periodic table, and the diatomic elements. [Slides 21 – 23]
- h) Be able to find elements on the periodic table by being able to match their names with their symbols. [Slide 24]
- i) **Not responsible for:** Petroleum processing. [Slides 8 and 9]
- j) **Not responsible for:** Flame test or firework info. [Slide 14]
- k) **Not responsible for:** Elements in the human body and cell phone. [Slides 25 and 26]

3) Section 4.3-4.5, 4.8 (Wednesday, September 9)

- a) Know definitions/terms. [Slides 4, 6, 7]
- b) Be able to identify the 3 main subatomic particles and their relative masses and charge. [Slide 8]
- c) Be able answer questions about Rutherford’s gold foil experiments and his nuclear theory of the atom. [Slides 10 – 15]
- d) Be able to define the term “isotope” and discuss related information. [Slide 16]
- e) Discuss applications of isotopes, in particular carbon-14 dating. [Slides 17 – 18]
- f) Be able to write isotope symbols and use isotope symbols to determine the number of neutrons and isotope has. [Slides 20 – 23] and [Slide 3 from next class]
- g) **Not responsible for:** Jokes. [Slide 9]
- h) **Not responsible for:** News articles about isotopes. [Slide 19]

4) Section 4.9 (Friday, September 11)

- a) Know definitions/terms. [Slide 4 and 5]
- b) Know how a mass spectrometer is used to measure isotope masses and % abundance. [Slide 7 – 8]
- c) Carry out atomic mass calculations. [Slides 9 – 12] and [Slide 3 – 4 from next class]

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5) Section 5.1-5.3 (Monday, September 14)

- a) Know definitions/terms. [Slide 5, 7, and 10]
- b) Know basic terminology related to the term “compound”. [Slide 8]
- c) Be able to use a chemical formula to determine how many atoms are present in a chemical formula. [Slide 8 – 9]
- d) Carry out the Law of Constant Composition. [Slides 11 – 13] and [Slide 4 from next class]

6) Section 5.4, 4.7, 5.5 (Wednesday, September 16)

- a) Know definitions/terms. [Slide 7, 8]
- b) Be able to compare/contrast “ionic compounds” and “molecular compounds” [Slides 9 – 11]
- c) Be able to use a periodic table to explain why some elements take on specific charges when they become ions. [Slides 12 – 13]
- d) Explain the process of forming ions and ionic compounds. [Slides 14 – 15]
- e) Use expected ion charges to predict the formulas of ionic compounds. [Slides 17 – 20] and [Slide 5 from next class]
- f) **Not responsible for:** Chemistry in the news. [Slide 5]
- g) **Not responsible for:** Electrolytes. [Slide 16]

7) Section 5.6-5.7 (Friday, September 18)

- a) Know definitions/terms. [Slides 3, 4, 7]
- b) Be able to convert back and forth between name ↔ formula for Type I and Type II, binary ionic compounds. [Slides 10 – 16] and [Slide 3 from next class]
- c) **Not responsible for:** Product labels. [Slides 8 – 9]

8) Section 5.7 cont. (Monday, September 21)

- a) Know basic information about polyatomic ions. [Slide 5]
- b) Be able to convert back and forth between name ↔ formula for Type I and Type II, binary ionic compounds that contain polyatomic ions. [Slides 6 – 11] and [Slide 4 from next class]

9) Section 5.9 (Wednesday, September 23)

- a) Know definitions/terms. [Slide 6]
- b) Given any ion, be able to write the formula for the corresponding acid. [Slide 7]
- c) Be able to convert back and forth between name ↔ formula for acids. [Slides 8 – 13] and [Slide 5 from next class]

10) Section 5.8, 5.10 (Friday, September 25)

- a) Know definitions/terms. [Slide 8]
- b) Be able to convert back and forth between name ↔ formula for molecular compounds. [Slides 9 – 11]
- c) Be able to name all the different types of compounds (ion, acid, molecular) that we have learned. [Slides 12 – 13]
- d) **Not responsible for:** Chemistry in the news. [Slide 6]