**Midterm Review Guide – Honors Chemistry**

Hi everybody! Here’s your midterm review guide for winter break, in case you want to study for your chemistry midterm. If you want to use it to study during the week before midterms, that’ll also work.

This review guide won’t actually contain practice problems for the midterm. However, you’ve got a metaphorical “lot” of questions on my website ([www.chemfiesta.com](http://www.chemfiesta.com)) and in the homework assignments you’ve gotten (which are all conveniently still located on Canvas.

**About the midterm:**

The midterm will be 60 questions. All of the questions are multiple choice, in exactly the same format as the bonus quiz last quarter. (In case you’re not a pro at multiple choice questions, I’ll be giving you three simulated “mini exams” in this format on the Wednesday, Thursday, and Friday before midterms. Not to worry – these aren’t real exams, just practice for the midterm.

**Links to handy resources:**

* [The Cavalcade o’ Chemistry](http://www.chemfiesta.com/): This is my website that’s full of tutorials and practice problems. I highly recommend it!
* [Chemistry: The Awesomest Science](https://misterguchctas.wordpress.com/2013/08/18/8/): This is the textbook I wrote for students. It’s pretty silly, but I think you’ll find that under the silliness is some very good chemistry!
* For specific topics, check out YouTube. They’ve got tutorials on everything you’d ever want!
* And, of course, if you look at this module, you’ll find lecture notes for everything we’ve covered this semester!

**Subjects to be covered on the midterm**

The following is a list of the topics that are fair game for the midterm exam. The numbers written after each topic indicates where in your textbook you can find these subjects, should you choose to use it as a reference text:

* The scientific method: The parts of the scientific method, why we use it, how to use it properly in scientific experiments, variables, etc. (Prologue B)
* Lab safety: The rules, especially goggles!
* Lab equipment: The lab equipment and what each piece is used for.
* SI units: Base units, prefixes, converting between base units and prefixes. (Chapter 1)
* Significant figures: What they are, how to find the number of significant figures, accuracy vs. precision, calculations with significant figures. (Chapter 1)
* Graphing: How to do it right, parts of a graph.
* Elements, compounds, and mixtures: What they are, how to tell them apart, homogeneous and heterogeneous mixtures, solutions. (Chapters 2-3)
* Chemical and physical changes: How to tell them apart, characteristics of each. (Chapter 3)
* Properties: Chemical and physical properties, intrinsic and extrinsic properties, should be able to determine which is which. (Chapter 3)
* Conservation of mass: What it is, examples of LOCOM (Chapter 3)
* Density: What it is, how to calculate it.(Chapter 3)
* Early models of the atom: (Chapter 2)
  + Greek atomic theory
  + Proust and Lavoisier and their ideas
  + Dalton’s theory of the atom
  + Thomson and his cathode ray experiment: How the experiment led to the plum pudding model of the atom / what this model says.
  + Rutherford and his gold foil experiment: How his experiment led to the nuclear model of the atom / what this model says.
* Protons, neutrons, and electrons calculations (Chapter 2)
* Isotopes: What they are, why/how they exist. (Chapter 2)
* Average atomic mass: What it is, how to find it, how it relates to isotopes. How time of flight mass spectrometry is used to find isotopic abundances. (Chapter 2)
* Bohr atom: His structure of the atom and how it fits together. (Chapter 8)
* Spectroscopy: The process by which light is given off by an atom, line spectra, continuous spectra, what spectroscopy is used for, the flame test. (Chapter 8)
* Quantum model of the atom: What it says / how it differs from the Bohr model. You should be familiar with the four different quantum numbers and how they are used to determine the properties/locations/shapes of electrons. (Chapter 8)
* Electron configurations: What they are, how to do the long and short versions of them, orbital filling diagrams. (Chapter 8)
* The periodic table: The different sections of the periodic table, metals/nonmetals/metalloids, what valence electrons are and how they affect the properties of the elements. (Chapter 4)
* Periodic trends: You should know what each of them is and what they mean. You should know how to determine the relative properties of each element using these trends. You should know why each trend changes as you move across and down the periodic table. (Chapter 8)
* The octet rule: If you really understand this, a lot of this stuff is much easier. Understand how this relates to periodic trends, reactivity, and the formation of ions. (Chapter 9).
* Ionic compounds: (Chapter 9)
  + How they’re formed through the transfer of electrons.
  + The properties of ionic compounds and how they’re related to the structure of ionic compounds.
* Naming ionic compounds. (Chapter 4)