

**AMS 105
APPLIED CHEMISTRY
PRÉCIS
SELF-STUDY LEARNING INSTRUCTION
Part B**



**DEPARTMENT OF APPLIED MILITARY SCIENCE
ROYAL MILITARY COLLEGE OF CANADA**

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INTRODUCTION

This chemistry self-study package contains 8 chapters and follows the AMS 105 Applied Chemistry précis. This package is designed to complement the in-class portion of AMS 105 Applied Chemistry and provides additional resources to help you with your learning. There will also be assignments that you will be required to complete. If you are feeling comfortable with the material, you may fast track through this package.

At the beginning of each chapter a list of learning objectives can be found which will help guide you in your studies. For each chapter you will be required to read the appropriate section in the AMS 105 précis. There are also online video links to help further explain the material. At the end of certain sections there are self quizzes that you should complete. These self quizzes are found in the AMS 105 précis. You should also verify your answers in the AMS 105 précis after completing the self-quiz to ensure that you understand the material.

As an additional resource you can refer to the following textbook:

OpenStax, Chemistry. OpenStax CNX. Jun 20, 2016 <http://cnx.org/contents/85abf193-2bd2-4908-8563-90b8a7ac8df6@9.311>

This textbook can be found at openBC campus at the following link <https://opentextbc.ca/chemistry/>. Specific sections of this textbook are referred to when applicable. This provides you additional explanations and practice questions. Answers to the additional practice problems are provided at the end of the given textbook section. The use of this online textbook is optional but provides additional resources if you need more help with a specific topic.

CHAPTER 6 – MOLES AND MOLAR MASS

6.0 Learning Objectives

- Describe and define moles. Understand Avogadro's number and know how to use it to calculate moles as well as number of molecules or atoms. (§ 6.1)
- Understand what molar mass is and how to calculate molar mass when given a molecular formula. (§ 6.2)
- Be able to convert between moles, mass and number of molecules. (§ 6.3)

6.1 Moles

Required Reading	Chapter 6.1 in AMS 105 Précis
Videos	Explaining moles https://www.youtube.com/watch?v=wI56mHUDJgQ (Video Length 10:49)
Exercises	Self Quiz 6.1

6.2 Molar Mass

Required Reading	Chapter 6.2 in AMS 105 Précis
Videos	How to calculate molar mass https://www.youtube.com/watch?v=Qflq48Foh2w (Video Length 13:10)
Exercises	N/A

6.3 Converting Between Mass, Moles and Number of Molecules

Required Reading	Chapter 6.3 in AMS 105 Précis
Videos	<p>1. How to convert between moles and number of atoms or molecules https://www.youtube.com/watch?v=HMAOrGpKtSg (Video Length 14:00)</p> <p>2. More examples of converting between moles and number of atoms or molecules https://www.youtube.com/watch?v=kGNtng0kGKk (Video Length 6:58)</p> <p>3. How to convert between moles and mass https://www.youtube.com/watch?v=CMnkSb2YsXI (Video Length 10:46)</p> <p>4. More examples of converting between moles and mass https://www.youtube.com/watch?v=ORXB8xNmJNM (Video Length 6:12)</p>
Exercises	Self Quiz 6.3

6.4 Additional Resources and Practice Questions

Read *Chemistry* Section 3.1 and complete exercises 3, 13, 15, 17, 19 and 21 (from section 3.1).

CHAPTER 7 – CHEMICAL NOMENCLATURE

7.0 Learning Objectives

- Understand the naming convention used – International Union for Pure and Applied Chemistry (IUPAC). (§ 7.1)
- Apply the naming convention to name binary ionic compounds. (§ 7.2)

- Apply the naming convention to name covalent compounds. (§ 7.3)
- Understand the differences between ionic and covalent naming. (§ 7.4)
- Apply the naming convention to name compounds with polyatomic ions. Also be able to give the chemical formula from a given chemical name. (§ 7.5)
- Apply the naming convention to name compounds with transition metals. Also be able to give the chemical formula from a given chemical name. Understand the history of naming transition metals. (§ 7.6)
- Know some of the common names used for compounds and describe why they are used. (§ 7.7)
- Describe the simple definition of an acid and be able to name a given acid. (§ 7.8)

7.1 Introduction to Naming

Required Reading	Chapter 7.1 in AMS 105 Précis
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Videos	N/A
Exercises	N/A

7.2 Ionic Compounds

Required Reading	Chapter 7.2 in AMS 105 Précis
Videos	How to name binary ionic compounds https://www.youtube.com/watch?v=gGi3rMog4tQ (Video Length 2:13)
Exercises	N/A

7.3 Covalent Compounds

Required Reading	Chapter 7.3 in AMS 105 Précis
Videos	How to name covalent compounds https://www.youtube.com/watch?v=DejkrR4pvRw (Video Length 10:45)
Exercises	N/A

7.4 Comparing Ionic and Covalent Naming

Required Reading	Chapter 7.4 in AMS 105 Précis
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Videos	Comparing ionic and covalent naming https://www.youtube.com/watch?v=vKNTspmfnqU (Video length 7:13)
Exercises	N/A

7.5 Compounds with Polyatomic Ions

Required Reading	Chapter 7.5 in AMS 105 Précis
Videos	<p>1. Naming compounds with polyatomic ions https://www.youtube.com/watch?v=PPfLDdIfOVA&t=21s (Video length 5:25)</p> <p>2. How to write ionic compound formulas https://www.youtube.com/watch?v=URc75hoKGLY&t=3s (Video length 11:43)</p> <p>3. How to write chemical formulas of compounds involving polyatomic ions https://www.youtube.com/watch?v=p9iQ5Qn42DM (Video length 11:20)</p>
Exercises	Self Quiz 7A

7.6 Compounds with Transition Metals

Required Reading	Chapter 7.6 in AMS 105 Précis
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Videos	<p>1. Naming compounds with transition metals https://www.youtube.com/watch?v=Rq0A-AHdB74 (Video length 10:09)</p> <p>2. Writing chemical formulas from a chemical name https://www.youtube.com/watch?v=H4nfE8gRX7Q (Video length 7:20)</p> <p>3. Examples of naming compounds with transition metals https://www.youtube.com/watch?v=8KSWRy2MMyM (Video length 11:57)</p>
Exercises	Self Quiz 7A

7.7 Common Names

Required Reading	Chapter 7.7 in AMS 105 Précis
Videos	N/A
Exercises	N/A

7.8 Acids

Required Reading	Chapter 7.8 in AMS 105 Précis
Videos	1. Introduction to naming acids

	https://www.youtube.com/watch?v=5Jb2u9ihfm4 (Video length 13:11) 2. Examples of naming acids https://www.youtube.com/watch?v=VyjnMk-Ta10 (Video length 8:41)
Exercises	Self Quiz 7.8

7.9 Additional Resources and Practice Questions

Read *Chemistry* Sections 2.6 and 2.7 and complete exercises 1, 3 and 5 (from section 2.6) and exercises 1, 3, 5, 7, 9 and 11 (from section 2.7).

CHAPTER 8 – CHEMICAL BONDING

8.0 Learning Objectives

- Describe the octet rule in bonding. (§ 8.1)
- Understand and explain the different types of chemical bonds (ionic, covalent and metallic). Also understand how energy is involved in bonding. (§ 8.2)

- Define metallic bonds and be able to describe the properties of metals. (§ 8.3)
- Understand electronegativity and how electronegativity is used to determine what type of bond is formed (ionic, covalent or polar covalent). (§ 8.4)
- Explain an ionic bond and understand what type of atoms form ionic bonds. (§ 8.5)
- Explain a covalent bond and understand what type of atoms form covalent bonds. Also understand how covalent bonds are formed. Explain single and multiple bonds and the implications for bond strength. (§ 8.6)
- Explain a polar covalent bond and be able to determine if a molecule is polar or non-polar. (§ 8.7)
- Be able to use the type of atom (metal or non-metal) to determine if the bond is ionic or covalent. If needed be able to use electronegativity values to determine the type of bond. (§ 8.8)
- Describe and apply VSEPR theory. Be able to use the geometry of a molecule to determine if a molecule is polar or non-polar. (§ 8.9)
- Understand how covalent and ionic bonds influence strength, melting and boiling points and solubility. (§ 8.10)
- Be able to draw Lewis dot diagrams for both ionic and covalent compounds. (§ 8.11)

8.1 Octet Rule in Bonding

Required Reading	Chapter 8.1 in AMS 105 Précis
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Videos	Explanation of octet rule https://www.youtube.com/watch?v=6Ecr7m-0E0E&t=157s (Video Length 4:45)
Exercises	N/A

8.2 Chemical Bonds

Required Reading	Chapter 8.2 in AMS 105 Précis
Videos	Explanation of the types of chemical bonds https://www.youtube.com/watch?v=AE5QcL4VfH4 (Video Length 4:17)
Exercises	N/A

8.3 Metallic Bonds

Required Reading	Chapter 8.3 in AMS 105 Précis
Videos	1. Explanation of metallic bonds and the properties of metals https://www.youtube.com/watch?v=XAnTCYZPJsE (Video Length 2:30) 2. More detailed explanation of metallic bonds and the properties of metals https://www.youtube.com/watch?v=Bjf9gMDP47s (Video Length 7:36)
Exercises	N/A

8.4 Electronegativity

Required Reading	Chapter 8.4 in AMS 105 Précis
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Videos	<p>1. Explanation of electronegativity https://www.youtube.com/watch?v=8N3jq4iljLM (Video Length 4:07)</p> <p>2. Explanation of how electronegativity is used to determine the type of bond formed https://www.youtube.com/watch?v=PoQjsnQmxok (Video Length 3:32)</p>
Exercises	N/A

8.5 Ionic Bonds and Compounds

Required Reading	Chapter 8.5 in AMS 105 Précis
Videos	<p>1. Explanation of ionic bonds https://www.youtube.com/watch?v=Qf07-8Jhhpc&t=33s (Video Length 7:19)</p> <p>2. More detailed explanation of ionic bonds https://www.youtube.com/watch?v=5EwmedLuRmw (Video Length 10:17)</p> <p>3. Electronegativity and ionic bonds https://www.youtube.com/watch?v=RkZNYuSho0M (Video Length 7:56)</p>
Exercises	N/A

8.6 Covalent Bonds and Compounds

Required Reading	Chapter 8.6 in AMS 105 Précis
Videos	<p>1. Explanation of covalent bonds https://www.youtube.com/watch?v=Mo4Vfqt5v2A</p>

	(Video Length 7:00) 2. Explanation of multiple bonds https://www.youtube.com/watch?v=aG3di-2Pxmo (Video Length 2:51)
Exercises	N/A

8.7 Polar Covalent Bonds and Compounds

Required Reading	Chapter 8.7 in AMS 105 Précis
Videos	1. Explanation of polar covalent bonds https://www.youtube.com/watch?v=15NvwwuTr5E (Video Length 4:57) 2. Explanation of polar and non-polar molecules https://www.youtube.com/watch?v=4yKszYl_4vI (Video Length 13:49)
Exercises	N/A

8.8 Determining if a Bond is Ionic, Covalent or Polar Covalent

Required Reading	Chapter 8.8 in AMS 105 Précis
Videos	Explanation of how to use electronegativity to determine if a bond is ionic, covalent or polar covalent

	https://www.youtube.com/watch?v=6twRHdevc-A (Video Length 3:57)
Exercises	N/A

8.9 VSEPR Theory

Required Reading	Chapter 8.9 in AMS 105 Précis
Videos	1. Introduction to VSEPR theory https://www.youtube.com/watch?v=nxebQZUVvTg (Video Length 20:29) 2. More examples of VSEPR theory https://www.youtube.com/watch?v=xwgid9YuH58 (Video Length 14:23)
Exercises	Self Quiz 8.9.2 and Self Quiz 8.9.3

8.10 Differences between Covalent and Ionic Compounds

Required Reading	Chapter 8.10 in AMS 105 Précis
Videos	N/A
Exercises	N/A

8.11 Lewis Dot Diagrams

Required Reading	Chapter 8.11 in AMS 105 Précis
Videos	1. Explanation of Lewis dot diagrams https://www.youtube.com/watch?v=1ZlnzyHahvo (Video Length 5:56)

	<p>2. Another explanation of Lewis dot diagrams https://www.youtube.com/watch?v=cluXl7o6mAw (Video Length 7:26)</p> <p>3. Lewis dot diagrams for ionic compounds https://www.youtube.com/watch?v=2urppjeSfgA (Video Length 5:41)</p>
Exercises	Self Quiz 8.11

8.12 Additional Resources and Practice Questions

Read *Chemistry* Sections 7.1, 7.2, 7.3 and 7.6. and complete exercises 1, 3 and 5 (from section 7.1), exercises 3, 5 and 11 (from section 7.2), exercises 1, 3 and 7 (from section 7.3) and exercise 1 (from section 7.6).

CHAPTER 9 – FORCES

9.0 Learning Objectives

- Describe the difference between intramolecular and intermolecular forces. (§ 9.1)
- Identify and describe intramolecular forces. (§ 9.2)
- Identify and describe intermolecular forces. Describe the three main types of intermolecular forces (hydrogen bonding, dipole-dipole forces and London dispersion forces). Describe the importance of these forces and their impact on the states of matter of compounds. (§ 9.3)

9.1 Types of Forces

Required Reading	Chapter 9.1 in AMS 105 Précis
Videos	Intramolecular forces versus intermolecular forces https://www.youtube.com/watch?v=VAziQxvmp_w (Video Length 3:25)
Exercises	N/A

9.2 Intramolecular Forces

Required Reading	Chapter 9.2 in AMS 105 Précis
Videos	Intramolecular forces https://www.youtube.com/watch?v=79drRU7CWFw (Video Length 9:11)
Exercises	N/A

9.3 Intermolecular Forces

Required Reading	Chapter 9.3 in AMS 105 Précis
Videos	1. Intermolecular forces and boiling points https://www.youtube.com/watch?v=08kGgrqaZXA&t=185s (Video Length 10:53) 2. Dipole-Dipole forces https://www.youtube.com/watch?v=zOvnu0KYyxo (Video Length 12:15) 3. Hydrogen bonding https://www.youtube.com/watch?v=PyC5r2mB4d4&t=93s (Video Length 8:59)

	4. London dispersion forces https://www.youtube.com/watch?v=yIuJfHOVh48 (Video Length 11:16)
Exercises	N/A

9.4 Additional Resources and Practice Questions

Read *Chemistry* Section 10.1 and complete exercises 7, 13 and 15 (from section 10.1).

CHAPTER 10 – CHEMICAL REACTIONS

10.0 Learning Objectives

- Describe a chemical reaction. (§ 10.1)
- Understand how energy is involved in a chemical reaction. Explain how elements and molecules react with each other to change reactants into products. (§ 10.2)
- Understand the notation used in a chemical reaction. (§ 10.3)
- Be able to balance a chemical reaction. (§ 10.4)
- List the different types of reactions (single displacement, double displacement, synthesis, decomposition, dissociation and precipitation, and neutralization) and their characteristics. Write a chemical equation to describe a specific reaction. Be able to apply solubility rules to predict if a precipitate is formed. Write complete and net ionic equations. (§ 10.5)

10.1 What is a Chemical Reaction?

Required Reading	Chapter 10.1 in AMS 105 Précis
Videos	Introduction to chemical reactions https://www.youtube.com/watch?v=TStjgUml1RQ (Video Length 9:12)
Exercises	N/A

10.2 Energy

Required Reading	Chapter 10.2 in AMS 105 Précis
Videos	Energy and chemical reactions

	https://www.youtube.com/watch?v=YacslU97Ofc (Video Length 4:51)
Exercises	N/A

10.3 Coefficients

Required Reading	Chapter 10.3 in AMS 105 Précis
Videos	Coefficients in a chemical reaction https://www.youtube.com/watch?v=wGNgy2XoYPs (Video Length 5:00)
Exercises	N/A

10.4 Balancing Chemical Reactions

Required Reading	Chapter 10.4 in AMS 105 Précis
Videos	1. Introduction to balancing chemical reactions https://www.youtube.com/watch?v=yA3TZJ2em6g (Video Length 12:22) 2. More examples of balancing chemical reactions https://www.youtube.com/watch?v=eNsVaUCzvLA (Video Length 14:55)
Exercises	Self Quiz 10.4

10.5 Types of Chemical Reactions

Required Reading	Chapter 10.5 in AMS 105 Précis
Videos	<ol style="list-style-type: none">1. Types of chemical reactions https://www.youtube.com/watch?v=aMU1RaRuSo (Video Length 12:53)2. More examples of types of chemical reactions https://www.youtube.com/watch?v=2qX9MOQQOmAM (Video Length 5:47)3. Dissociation reactions https://www.youtube.com/watch?v=0cPFx0wFuVs (Video Length 4:09)4. Explanation of solubility https://www.youtube.com/watch?v=KOrq5i0rXUA (Video Length 7:34)5. Precipitation reactions and net ionic equations

	<p>https://www.youtube.com/watch?v=leCoWeIN-h8 (Video Length 10:16)</p> <p>6. More examples of net ionic equations https://www.youtube.com/watch?v=MJy5CNzd6sY (Video Length 9:03)</p> <p>7. Explanation of neutralization reactions and some examples https://www.youtube.com/watch?v=tIXtv9mDzqk (Video Length 10:50)</p> <p>8. Neutralization reactions and net ionic equations https://www.youtube.com/watch?v=UfTJrAPjeys (Video Length 13:32)</p>
Exercises	Self Quiz 10.5.2, Self Quiz 10.5.3 and Self Quiz 10.5.4

10.6 Additional Resources and Practice Questions

Read *Chemistry* Sections 4.1 and 4.2 (precipitation reactions and solubility rules, and acid-base reactions) and complete exercises 1, 3 and 11 (from section 4.1) and exercise 10 (from section 4.2).

CHAPTER 11 – NUCLEAR REACTIONS

11.0 Learning Objectives

- Understand the difference between a chemical reaction and a nuclear reaction. (§ 11.1)
- Describe a nuclear fission reaction and why it is so powerful. (§ 11.2)
- Describe a nuclear fusion reaction and why it is so powerful. (§ 11.3)

11.1 Introduction

Required Reading	Chapter 11.1 in AMS 105 Précis
Videos	Nuclear versus chemical reactions https://www.youtube.com/watch?v=jawWDMb6VAQ (Video Length 2:50)
Exercises	N/A

11.2 Fission

Required Reading	Chapter 11.2 in AMS 105 Précis
Videos	Nuclear fission https://www.youtube.com/watch?v=pY5HeZpNr8 (Video Length 8:58)

Exercises	N/A
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11.3 Fusion

Required Reading	Chapter 11.3 in AMS 105 Précis
Videos	Nuclear fusion https://www.youtube.com/watch?v=Cb8NX3HiS4U (Video Length 3:19)
Exercises	N/A

11.4 Additional Resources

Read *Chemistry* Section 21.4.

CHAPTER 12 – STOICHIOMETRY

12.0 Learning Objectives

- Understand the concept of stoichiometry. (§ 12.1)
- Describe and calculate stoichiometric masses in reactions using mole ratios. (§ 12.2)
- Describe and identify limiting reactants as well as excess reactants. Based on the limiting reactant, be able to calculate the amount of product produced as well as the amount of excess reactant. (§ 12.3)
- Define and understand actual and theoretical yields. (§ 12.4)
- Determine the actual yield and be able to calculate theoretical and percent yields. (§ 12.5)

12.1 Definitions

Required Reading	Chapter 12.1 in AMS 105 Précis
Videos	Introduction to stoichiometry https://www.youtube.com/watch?v=7In4DSfGak (Video Length 8:54)
Exercises	N/A

12.2 Stoichiometric Masses

Required Reading	Chapter 12.2 in AMS 105 Précis
Videos	1. Mole ratios https://www.youtube.com/watch?v=S6UQX7ZdkTg&list=PLaWEo7fLMF9b-imkPoVf3if-l7rSlmpH (Video Length 21:00) 2. Using mole ratios to calculate mass https://www.youtube.com/watch?v=7Cfq0ilw7ps (Video Length 25:15)

Exercises	Self Quiz 12A
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12.3 Limiting and Excess Reactants

Required Reading	Chapter 12.3 in AMS 105 Précis
Videos	<p>1. Introduction to limiting and excess reactants https://www.youtube.com/watch?v=nZOVr8EMwRU&t=378s (Video Length 16:57)</p> <p>2. Basic example of limiting reactants https://www.youtube.com/watch?v=Mlu_v8rE1TY (Video Length 10:46)</p> <p>3. More advanced example of limiting reactants https://www.youtube.com/watch?v=N0dTXcoHI-I (Video Length 13:48)</p>
Exercises	N/A

12.4 Actual and Theoretical Yields

Required Reading	Chapter 12.4 in AMS 105 Précis
Videos	<p>Explanation of actual and theoretical yields https://www.youtube.com/watch?v=4kHZcZ_kZkw (Video Length 8:34)</p>

Exercises	N/A

12.5 Percent Yields

Required Reading	Chapter 12.5 in AMS 105 Précis
Videos	<p>1. How to calculate percent yield https://www.youtube.com/watch?v=jtAj0s203Cl (Video Length 6:23)</p> <p>2. More examples on percent yield https://www.youtube.com/watch?v=MebTIQNRU5g (Video Length 21:29)</p>
Exercises	Self Quiz 12B

12.6 Additional Resources and Practice Questions

Read *Chemistry* Section 4.4 and complete exercises 4, 6, 8, 12 and 14 (from section 4.4).

CHAPTER 13 – SOLUTIONS

13.0 Learning Objectives

- Describe the different components of a solution. (§ 13.1)
- Explain forces in a solution and understand what is meant by the phrase “like dissolves like”. (§ 13.2)
- Identify and describe types of solutions. Understand ion-dipole forces. Understand how an aqueous solution is prepared. Explain the role of enthalpy, entropy and Gibb’s free energy in forming solutions. Be able to calculate Gibb’s free energy and determine if a solute will dissolve in water. (§ 13.3)
- Define solubility and be able to describe a saturated solution. Calculate the amount needed of a given compound to prepare a saturated solution. Understand the effects of temperature and pressure on solubility. (§ 13.4)
- Explain concepts of molarity and concentration. Calculate between concentration, mass and volume. Describe how to prepare a solution of desired molarity. (§ 13.5)
- Describe applications of solutions such as soda and soap. (§ 13.6)

13.1 Definitions

Required Reading	Chapter 13.1 in AMS 105 Précis
Videos	Components of a solution https://www.youtube.com/watch?v=SaNZAyqOeT0 (Video Length 7:51)
Exercises	N/A

13.2 Forces in Dissolution

Required Reading	Chapter 13.2 in AMS 105 Précis
Videos	1. Explaining the phrase “like dissolves like” https://www.youtube.com/watch?v=0ThbvPk-j2A (Video Length 4:07) 2. Explaining forces in dissolution https://www.youtube.com/watch?v=uJfZaAHxXIU (Video Length 8:23)
Exercises	N/A

13.3 Types of Solutions

Required Reading	Chapter 13.3 in AMS 105 Précis
Videos	<ol style="list-style-type: none">1. Explaining ion-dipole forces https://www.youtube.com/watch?v=DwNmEc9x1U4 (Video Length 11:25)2. Explaining solvation https://www.youtube.com/watch?v=gxmpr09Xk4Y (Video Length 5:03)3. Introduction to enthalpy https://www.youtube.com/watch?v=zKara65HbL0&list=PLX4e2DxFRGQL4souQn4p1zmYQlrWZljz7 (Video Length 8:45)4. Enthalpies of solutions https://www.youtube.com/watch?v=2LLN0BFBZ6M (Video Length 7:37)5. Introduction to entropy https://www.youtube.com/watch?v=jlGHRJrttSo (Video Length 9:29)6. Introduction to Gibb's free energy https://www.youtube.com/watch?v=pQXjL3LQ_h4 (Video Length 11:18)
Exercises	Self Quiz 13.3.3.4

13.4 Solubility

Required Reading	Chapter 13.4 in AMS 105 Précis
Videos	Explaining solubility and saturated solutions https://www.youtube.com/watch?v=cHBIDVg9nR8 (Video Length 13:19)
Exercises	Self Quiz 13.4

13.5 Concentration

Required Reading	Chapter 13.5 in AMS 105 Précis
Videos	1. Introduction to molarity https://www.youtube.com/watch?v=KLjWa9cE2uk (Video Length 8:46) 2. Explaining concentration https://www.youtube.com/watch?v=SXf9rDnVFao (Video Length 11:42) 3. More examples of calculating concentration https://www.youtube.com/watch?v=sWfn8hbXRp8 (Video Length 11:17)
Exercises	Self Quiz 13.5

13.6 Applications of Solutions

Required Reading	Chapter 13.6 in AMS 105 Précis
Videos	Explaining of how soap works https://www.youtube.com/watch?v=NPvWSo0Us9A (Video Length 2:37)
Exercises	N/A

13.7 Additional Resources and Practice Questions

Read *Chemistry* Sections 3.3, 11.1 and 11.3 and complete exercises 2, 6, 8, 10, 12, 14, 22 and 24 (from section 3.3).