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# Errata sheet for AP Chemistry

This document lists corrections and/or refinements made to the AP Chemistry Course and Exam Description since it was published in May of 2019.

## Corrections to AP Chemistry CED as of September, 2019

The items listed below have been corrected in the online version of the CED. Teachers can print out the individual pages in order to update their printed CED binders.

- In Unit 6, the skill pairing for Topic 6.6 was changed from 4.C to 5.F. This impacts the Unit at a Glance (p. 118) and Topic page 6.6 (p. 126)
- In the Answer Key for the sample exam items (p. 226) skill 4.C was added to the list of skills assessed in FRQ 1
- In the Answer Key for the sample exam items (p. 226) skill 5.C was added to the list of skills assessed in FRQ 2

## UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skill	Class Periods
			~10–11 CLASS PERIODS
ENE-2	<b>6.1 Endothermic and Exothermic Processes</b>	<b>6.D</b> Provide reasoning to justify a claim using chemical principles or laws, or using mathematical justification.	
	<b>6.2 Energy Diagrams</b>	<b>3.A</b> Represent chemical phenomena using appropriate graphing techniques, including correct scale and units.	
	<b>6.3 Heat Transfer and Thermal Equilibrium</b>	<b>6.E</b> Provide reasoning to justify a claim using connections between particulate and macroscopic scales or levels.	
	<b>6.4 Heat Capacity and Calorimetry</b>	<b>2.D</b> Make observations or collect data from representations of laboratory setups or results, while attending to precision where appropriate.	
	<b>6.5 Energy of Phase Changes</b>	<b>1.B</b> Describe the components of and quantitative information from models and representations that illustrate both particulate-level and macroscopic-level properties.	
	<b>6.6 Introduction to Enthalpy of Reaction</b>	<b>5.F</b> Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures).	
ENE-3	<b>6.7 Bond Enthalpies</b>	<b>5.F</b> Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures).	
	<b>6.8 Enthalpy of Formation</b>	<b>5.F</b> Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures).	
	<b>6.9 Hess's Law</b>	<b>5.A</b> Identify quantities needed to solve a problem from given information (e.g., text, mathematical expressions, graphs, or tables).	



Go to [AP Classroom](#) to assign the **Personal Progress Check** for Unit 6. Review the results in class to identify and address any student misunderstandings.

## SUGGESTED SKILL

 Model Analysis

## 5.F

Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures).



## AVAILABLE RESOURCES

- AP Chemistry Lab Manual > [Investigation 12: The Hand Warmer Challenge: Where Does the Heat Come From?](#)

## TOPIC 6.6

# Introduction to Enthalpy of Reaction

## Required Course Content

### ENDURING UNDERSTANDING

**ENE-2**

Changes in a substance's properties or change into a different substance requires an exchange of energy.

### LEARNING OBJECTIVE

**ENE-2.F**

Calculate the heat  $q$  absorbed or released by a system undergoing a chemical reaction in relationship to the amount of the reacting substance in moles and the molar enthalpy of reaction.

### ESSENTIAL KNOWLEDGE

**ENE-2.F.1**

The enthalpy change of a reaction gives the amount of heat energy released (for negative values) or absorbed (for positive values) by a chemical reaction at constant pressure.

**X THE TECHNICAL DISTINCTIONS BETWEEN ENTHALPY AND INTERNAL ENERGY WILL NOT BE ASSESSED ON THE AP EXAM.**

*Rationale: These distinctions are beyond the scope of the AP Chemistry course. Most reactions studied at the AP level are carried out at constant pressure. Under these conditions the enthalpy change of the process is equal to the heat (and by extension, the energy) of reaction. For example, in the AP Chemistry course the terms "bond energy" and "bond enthalpy" are often used interchangeably.*

# Answer Key and Question Alignment to Course Framework

Multiple-Choice Question	Answer	Skill	Learning Objective	Unit
1	C	1.A	SAP-1.A	1
2	C	6.C	SAP-4.C	2
3	C	2.D	SPQ-3.C	3
4	C	5.C	SPQ-4.A	4
5	A	5.F	SPQ-4.A	4
6	D	6.F	TRA-3.A	5
7	B	5.F	ENE-2.D	6
8	D	5.F	TRA-7.E	7
9	B	5.F	TRA-8.A	7
10	C	5.F	SPQ-5.B	7
11	C	5.F	SAP-9.A	8
12	B	5.F	ENE-6.B	9
13	A	5.E	TRA-1.B	4
14	C	2.C	SPQ-4.A	4
15	B	2.B	TRA-3.A	5

Free-Response Question	Question Type	Skill	Learning Objective	Unit
1	Short	3.A, 3.B, 4.C	SAP-1.B	1, 2
2	Long	1.A, 3.B, 4.C, 5.C, 5.E, 5.F, 6.D	TRA-1.B, TRA-2.A, SPQ-4.A, SAP-4.A, SAP-4.C, ENE-3.D, ENE-4.A, ENE-4.C	2, 4, 6, 9

The scoring information for the questions within this course and exam description, along with further exam resources, can be found on the [AP Chemistry Exam Page](#) on AP Central.