Basic Principles and Calculations in Chemical Engineering

Ninth Edition

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Warning and Disclaimer

When reviewing corrections, always check the print number of your book. Corrections are made to printed books with each subsequent printing.

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Corrections for August 1, 2022

Pg	Error	Correction
	Global: Any reference to chemical engineering software available on a companion website is erroneous.	Specific corrections are listed below.
151	CE software on this book's Web site	Revise the sentence to: "You can look up the values in physical properties databases available on the Internet, in reference books, and in many other places."
489-490	Furthermore, we will often refer to the tables on the website for this book as the "steam tables." In this book, you will also find a foldout in the back pocket that contains abbreviated steam tables in both AE and SI units. From the website, you can obtain values of the properties of water in mixed units that are continuous over	Replace with: "The properties of water and steam from one source may not agree precisely with other sources because the values available from different sources are likely generated by using equations having different accuracy and precision."

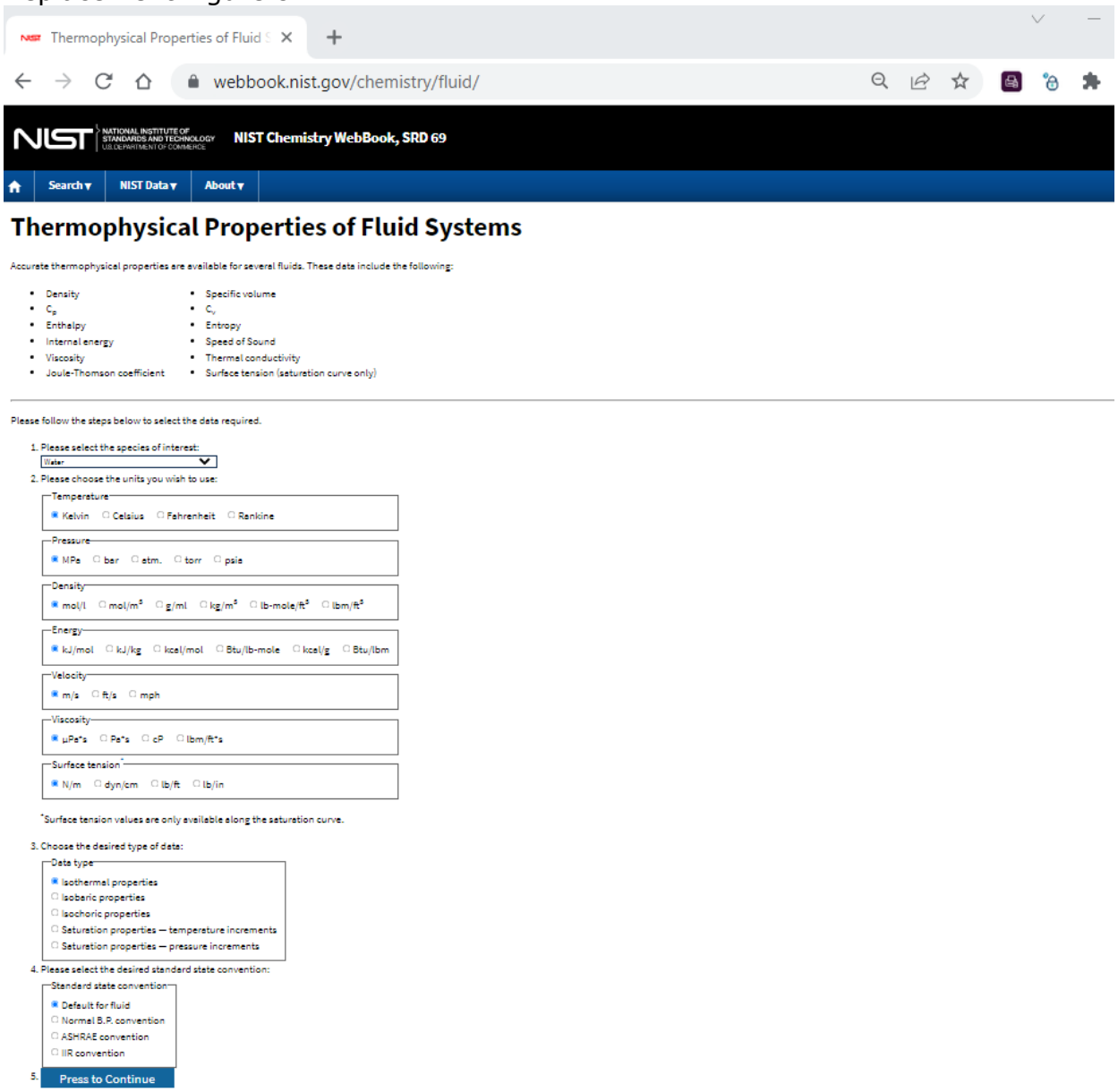
	the permitted range of values, thus avoiding single or double interpolation in tables. The properties of water and steam from the website may not agree precisely with other sources because the values from the website are generated by simpler equations than those of the other sources.	
592	Note that we used the data from the steam tables in the CE program from the website that accompanies this book.	Replace with: "Data from steam tables are used in these calculations."
592	You can use the steam chart in the CE software that accompanies this book to get the necessary property values.	Replace with: "The necessary property values can be obtained from the steam tables."
593	We will use the steam table on the CE software on the website that accompanies this text.	Replace with: "The necessary property values can be obtained from the steam tables."
600	The recommended approach to determining enthalpies for solving problems in this text is to use the CE software that can be found on the website that accompanies this text. It can predict enthalpies for more than 700 compounds over a wide range of temperatures. Figure 8.14 shows the enthalpy page for the CE software. Note that you can select the compound or element from one of the three compound lists, select either a gas or liquid, provide the temperature and reference temperature, and click OK, and the result is shown immediately. Although the results from the CE software are not as accurate as those provided in industrial databases, they are more than sufficient for working the problems in this text and much more convenient than other sources for enthalpies.	Replace with: "A number of resources are available on the Internet for obtaining the values of enthalpy and other thermophysical properties. Many of them can be accessed without any charge, while a licensing fee is required to access the information contained in others. Some of these resources are listed on page 616. Figure 8.14 shows a listing of the thermophysical property data, which is available from the National Institute of Standards and Technology (NIST, https://webbook.nist.gov/chemistry/fluid/). You can specify the substance, choose the property units, the type of data, and the standard state conditions. Clicking the continue button will bring up a screen that allows you to input the pressure and temperature values, with the software returning the property values immediately."

601	Figure 8.14 and caption: Screenshot of the enthalpy page from the CE software	Replace with new image (see end of this errata sheet) and caption: "Screenshot of NIST webpage"
605	Appendix F on the accompanying website . . . enthalpy changes.	Delete in its entirety.
609	Some common values of $\Delta\hat{H}$ for phase changes are listed in Appendix E on the website that accompanies this book, and more than 700 are used by the CE physical property software on the website.	Replace with: "Values of $\Delta\hat{H}$ for phase change for many common compounds are available from several sources available on Internet, such as those listed on page 616."
610	The CE physical property software on the Web site that accompanies this book . . . (1 atm pressure).	Replace the sentence with: "The heat of vaporization at the normal boiling point (1 atm pressure) data for most substances are readily available from many resources, some of which are listed later on page 616."
612	But using the CE software on the website, . . . linear interpolation.	Delete in its entirety.
614	However, if you know the quality . . . the CE program on the website will return the properties of the mixture shown as parameters.	Delete in its entirety.
616	The CE program that accompanies this book is an example. The program . . . save time in your calculations, we recommend using this software.	Delete in its entirety.
616	www.lib.berkeley.edu/ENGI/physchemData.html	Replace with: guides.lib.berkeley.edu/physical-chemical-properties
617	For example, you can introduce the value of $\hat{H}$ and p into the dialog box in the steam tables in the CE software on the website that accompanies this book and recover the values of T at the state that is specified by $\hat{H}$ and p.	Replace with: "Some software programs will allow you to input the values of $\hat{H}$ and p and recover the value of T at the state that is specified by $\hat{H}$ and p."

622	Now, using the CE software on the website that accompanies this text, let's calculate the enthalpy changes for each component:	Replace with: "Now, let's calculate the enthalpy changes for each component on the basis of equation 8.14:"
625	Either integrate heat capacity equations (poor choice), or better, use the CE physical property software on the website, which gives $\Delta\hat{H}\_i$ directly for the transition from 500°C to 300°C.	Replace with: "Either integrate the heat capacity equations, or if you have access to it, use a software that gives $\Delta\hat{H}\_i$ directly for the transition from 500°C to 300°C."
642	The data come from steam tables in the CE software on the website that accompanies this book.	Replace with: "The source of the data are the steam tables, readily available on the Internet."
684	Appendix C contains standard heats of formation for a number of molecules. In the CE software on the Web site that accompanies this book, you will find heats of formation for more than 700 compounds, provided through the courtesy of Professor Yaws.[3]	Replace with: "Appendix C contains standard heats of formation for a number of molecules. Additionally, heats of formation for more than 700 compounds can be obtained using the correlations reported by Professor Yaws.[3]"
697	To avoid inconsistencies, the sensible heat data in the sixth column have been taken from the CE program from the Web site that accompanies this book instead of integrating heat capacity equations by hand.	Replace with: "The sensible heat data shown in tables below have been obtained through a computer program developed to perform calculations of equation 8.14."
698	The details of the heat of formation of compounds in solutions are presented in Chapter 12 on the Web site that accompanies this text.	Replace with: "The heats of formation of compounds in solution are available from sources such as *Perry's Chemical Engineers' Handbook*, *CRC Handbook of Chemistry and Physics*, and many others. For many compounds, the values are reported as function of solute concentration, allowing accounting of the heat of solution in calculations for increased accuracy."
704	We use the SI system for most of the solution for convenience, but the CE program on the Web site that accompanies this book makes use of the AE system just as easily.	Replace with: "We use the SI system for most of the solutions for convenience, but the calculations can be made just as easily using the AE system."

707	The Web site that accompanies this text gives different values.	Delete in its entirety.
709	Because you do not know the flame temperature (e.g., the solution) to a problem before you start, if you use tables such as Appendix C or the physical property software on the Web site that accompanies this text in calculating the "sensible heats" of the various streams entering and leaving the reactor, the solution will involve trial and error. To find the exit temperature for which $\Delta H = 0$ in the energy balance, the simplest approach is to use the CE software on the website that accompanies this text:	Replace with: "Because you do not know the flame temperature (e.g., the solution) to a problem before you start, the solution will involve trial and error. To find the exit temperature for which $\Delta H = 0$ in the energy balance:"
710	We use data from Appendix C and the CE software from the Website that accompanies this book.	Replace with: "We use data from Appendix C and other resources available on the Internet (for example, websites listed on page 616) and literature (correlations reported by Professor Yaws)."
711	Some enthalpies could not be calculated using the CE physical property software on the accompanying Web site as the states at some temperatures were out of range.	Delete in its entirety.
723	To make an energy balance, you have to get information about the heats of formation and the sensible heats. The data used below have been taken from the CE software on the Web site that accompanies this book.	Replace with: "To make an energy balance, you have to get information about the heats of formation and the sensible heats using the resources mentioned earlier."
761	On the website that accompanies this book, you will find an animated example of using the humidity chart to get data.	Delete in its entirety.

Replacement Figure 8.14:



Updated 08-16-2022

This errata sheet is intended to provide updated technical information. Spelling and grammar misprints are updated during the reprint process, but are not listed on this errata sheet.

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