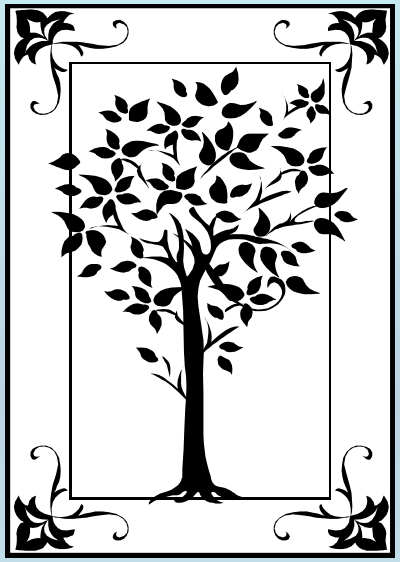
METADATA AND NUMERICAL DATA CAPTURE:
Surface Tension
(for 1 – Component)

Guided Data Capture (GDC)



This tutorial describes
METADATA AND NUMERICAL DATA CAPTURE:
for **Surface Tension (1 component)**
with the Guided Data Capture (GDC) software.

NOTE:

The tutorials proceed sequentially to ease the descriptions. It is not necessary to enter *all* compounds before entering *all* samples, etc.

Compounds, samples, properties, etc., can be added or modified at any time.

However, the hierarchy must be maintained (i.e., a property cannot be entered, if there is no associated sample or compound.)

The experimental data used in this example is from:

1442 *J. Chem. Eng. Data* 2002, *47*, 1442−1445

Surface Tension of Heptane, Decane, Hexadecane, Eicosane, and Some of Their Binary Mixtures

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Surface tension measurements were performed by the Wilhelmy plate method. Measured systems included pure heptane, decane, hexadecane, eicosane, and some of their binary mixtures at temperatures from 293.15 K to 343.15 K with an average absolute deviation of 1.6%. The results were compared with a new corresponding states model. The average absolute deviation was found to be 1.0%.

Surface Tension for 1 component
n-heptane

Table 1. Pure Component Data and Comparison with Literature

		γ/mN·m^{-1} ± 0.02 mN·m^{-1}				
n-alkane	*T*/K	this work	Jasper[3]	McLure[4]	Jasper[5]	Koefoed[6]
n-C_7H_{16}	293.15	20.53	20.28	20.21	20.14	20.30
	303.15	19.49	19.27	19.17	19.17	19.31
	313.15	18.50	18.25	18.19	18.18	
	323.15	17.44	17.24	17.18	17.20	
	333.15	16.50	16.22	16.19	16.22	

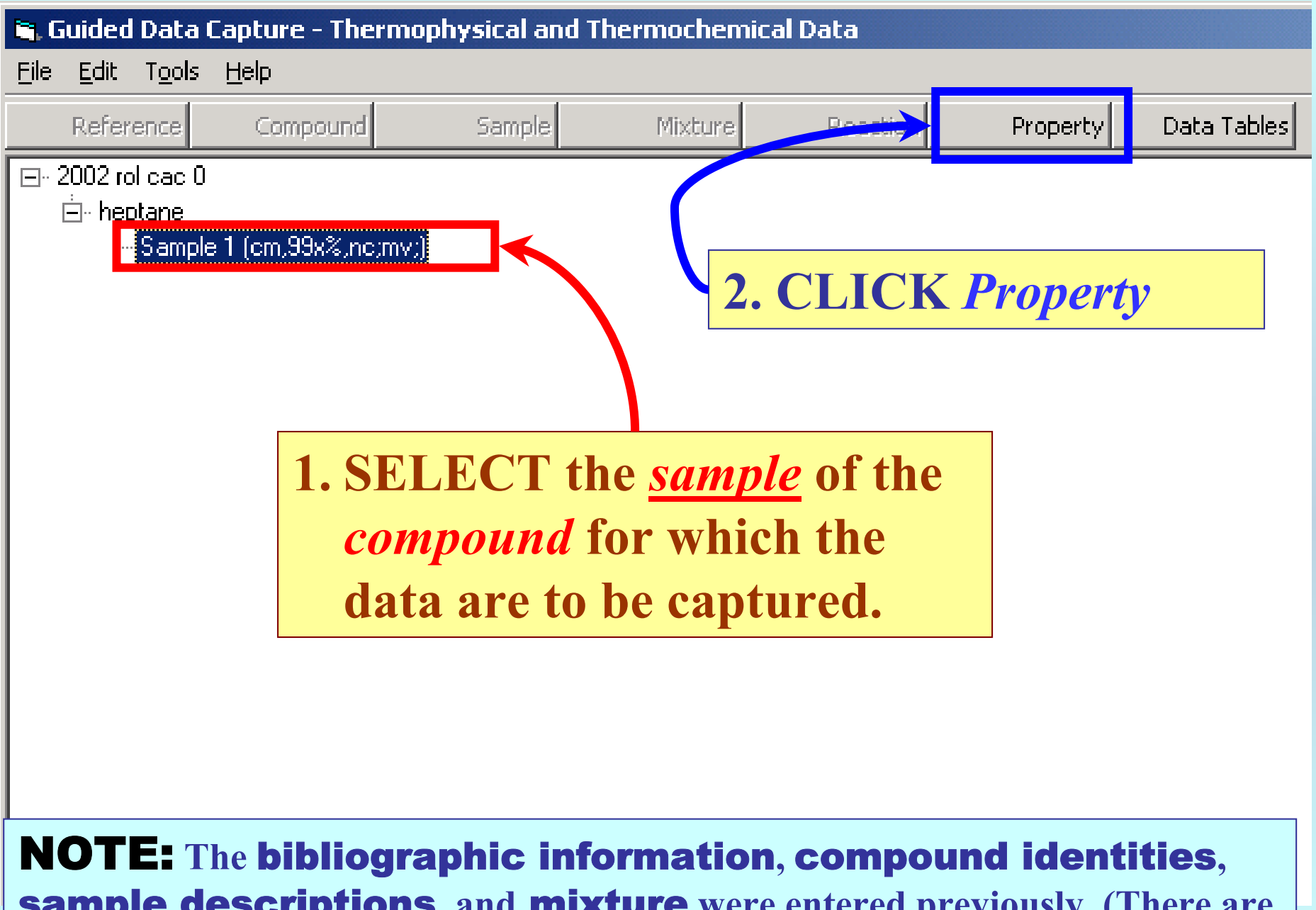
These data are considered here.

Experimental Method Info :

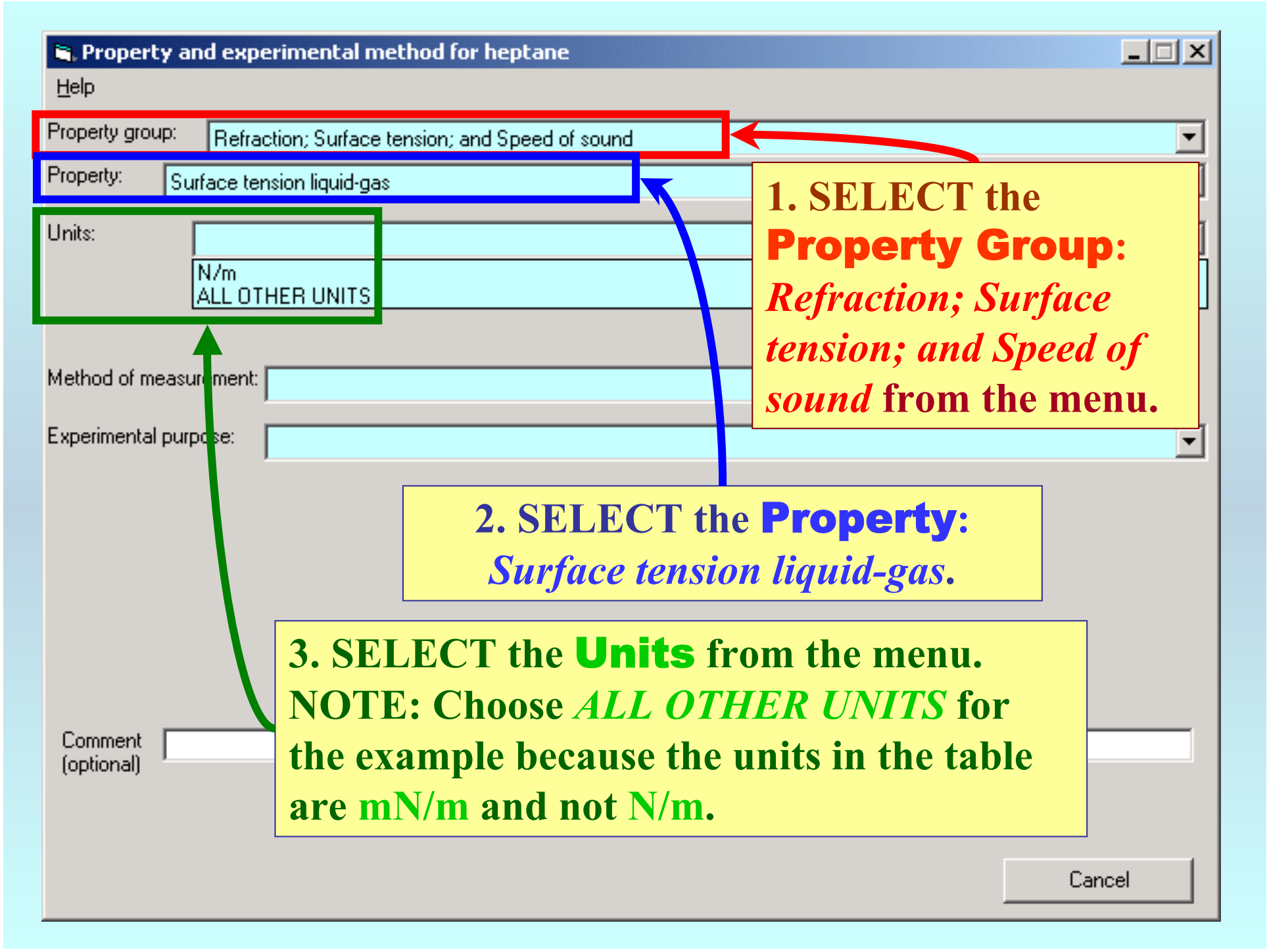
NIMA DST 9005 tensiometer from NIMA Technology:
Wilhelmy plate method

Authorís uncertainty estimates:

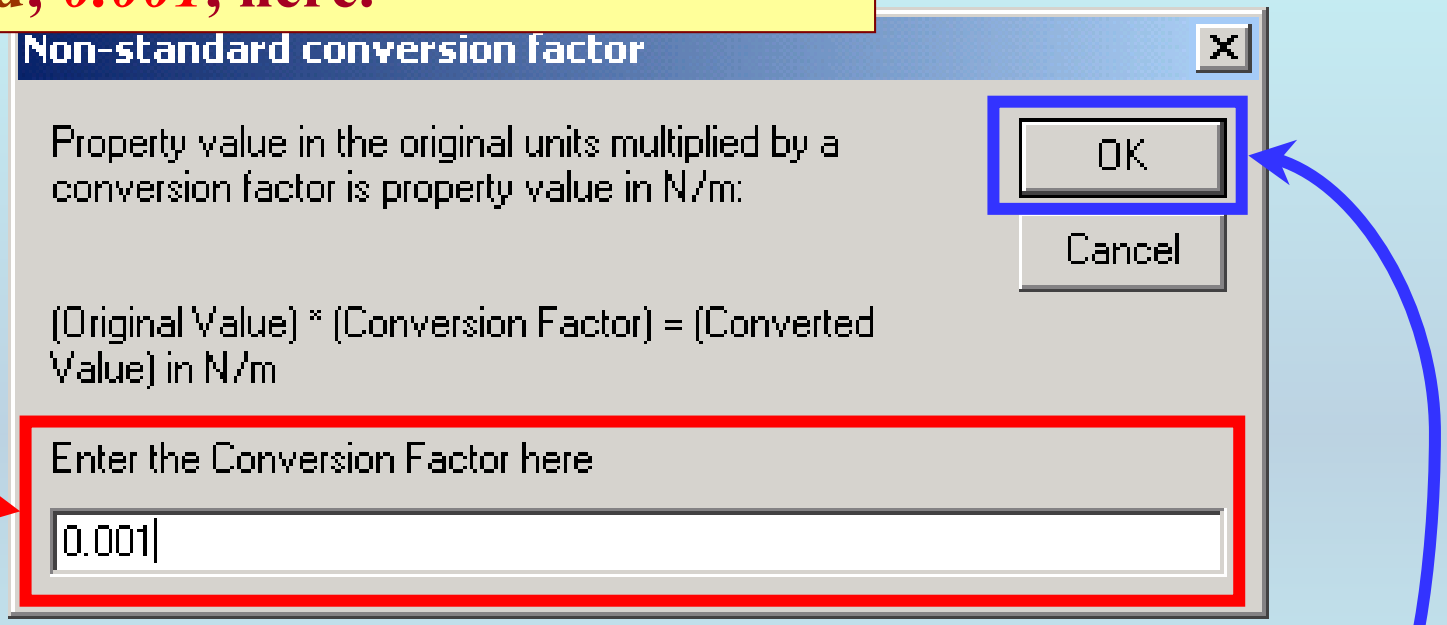
***Surface tension*:**
0.02 mN/m



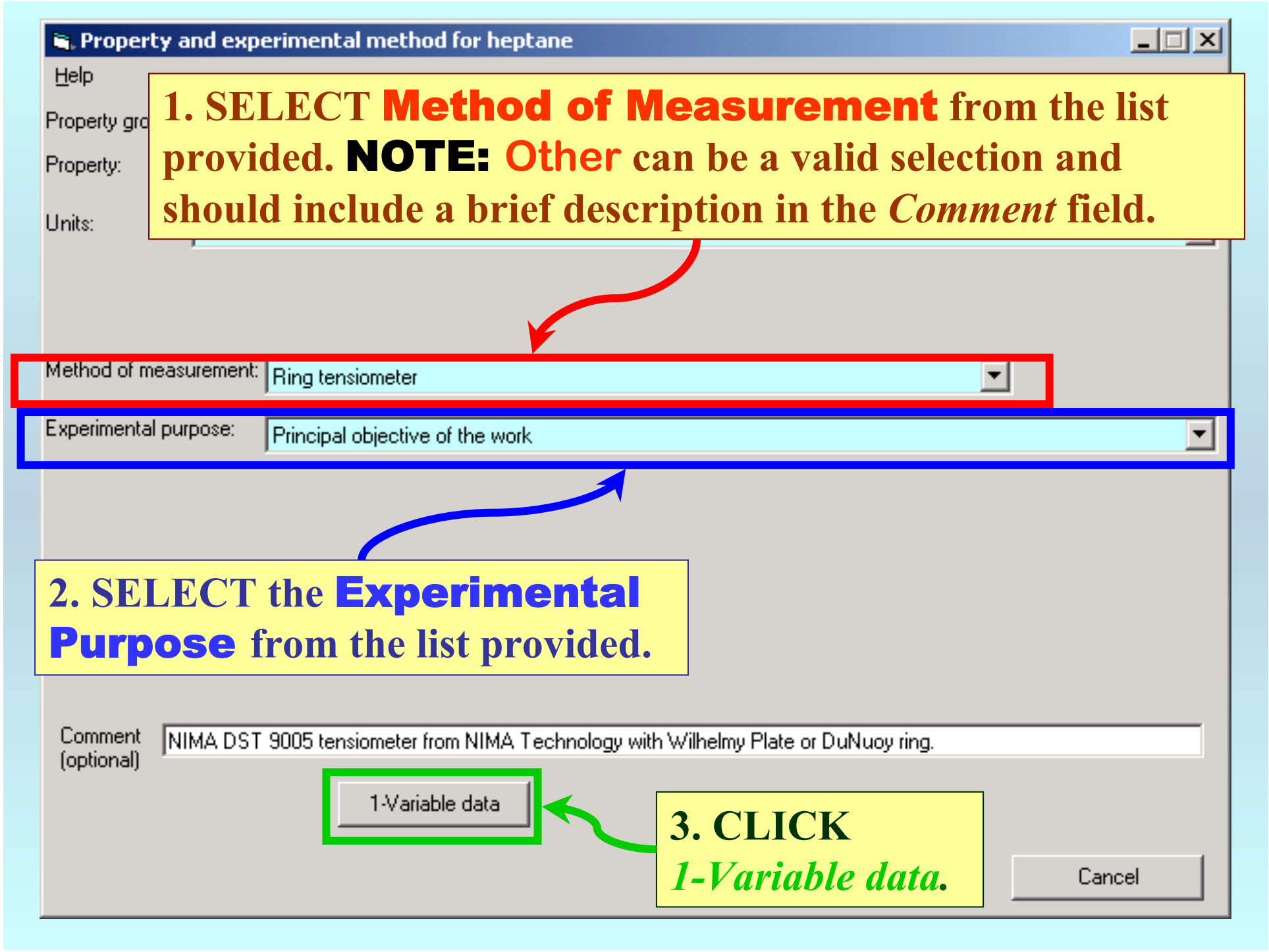
NOTE: The **bibliographic information**, **compound identities**, **sample descriptions**, and **mixture** were entered previously. (There are separate tutorials, which describe capture of this information, if needed.)

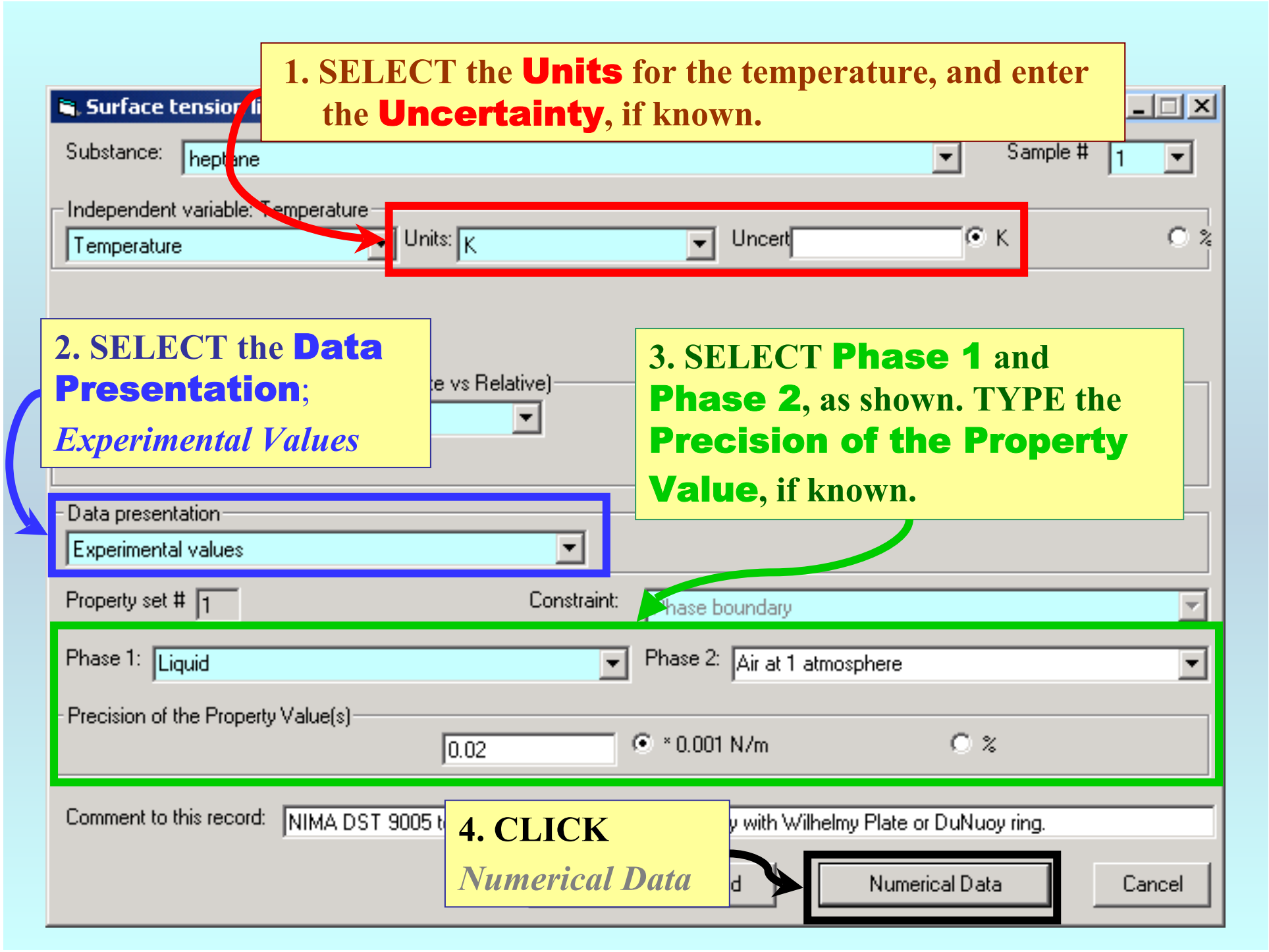

Property and experimental method for heptane
Help
Property group:
Refraction; Surface tension; and Speed of sound
Property:
Surface tension liquid-gas
Units:
N/m
ALL OTHER UNITS
Method of measurement:
Experimental purpose:
Comment (optional)
Cancel
1. SELECT the Property Group: Refraction; Surface tension; and Speed of sound from the menu.
2. SELECT the Property: Surface tension liquid-gas.
3. SELECT the Units from the menu. NOTE: Choose ALL OTHER UNITS for the example because the units in the table are mN/m and not N/m.

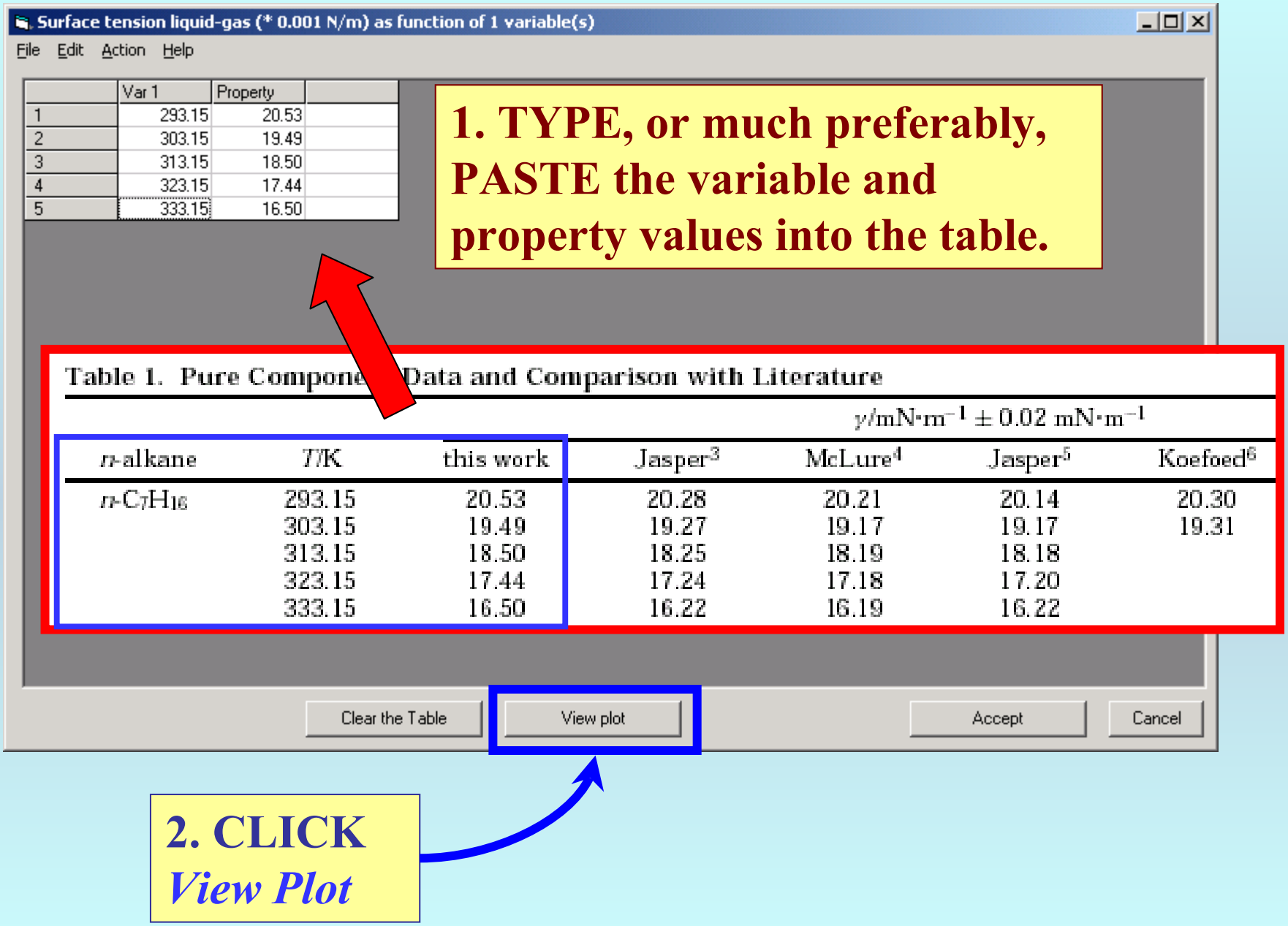
1. TYPE the appropriate **Conversion Factor** in the field; *0.001*, here.

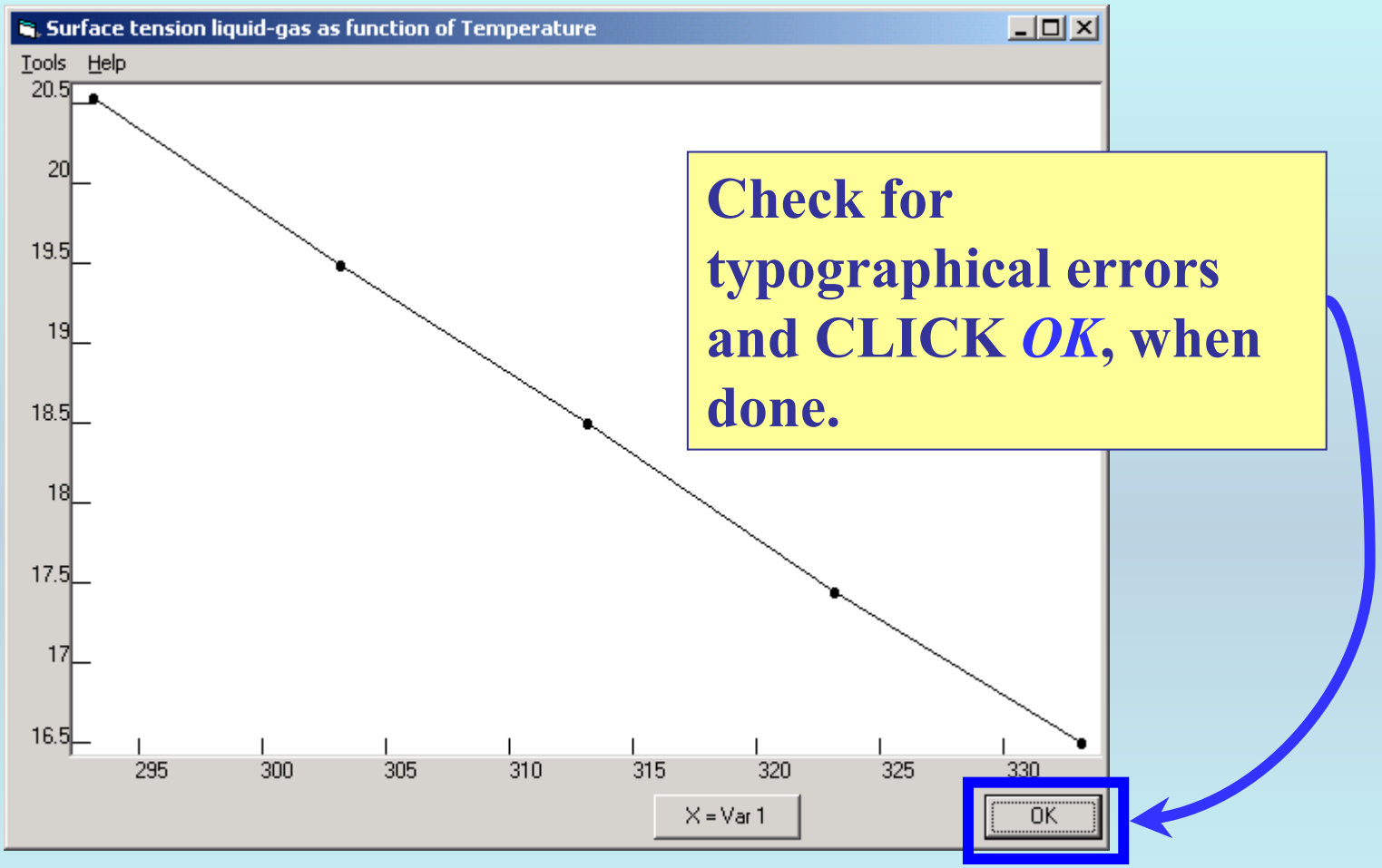


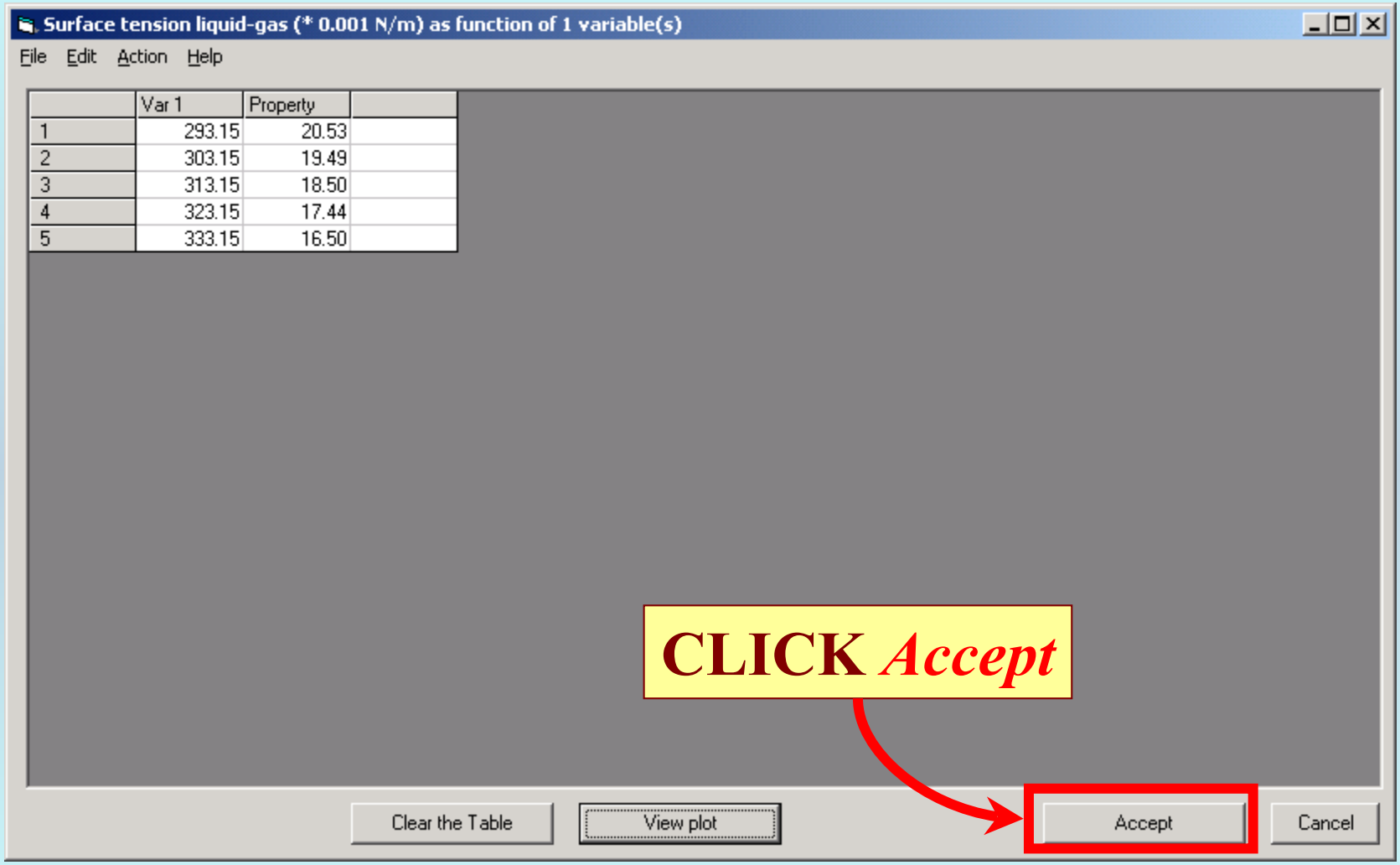
2. CLICK *OK*

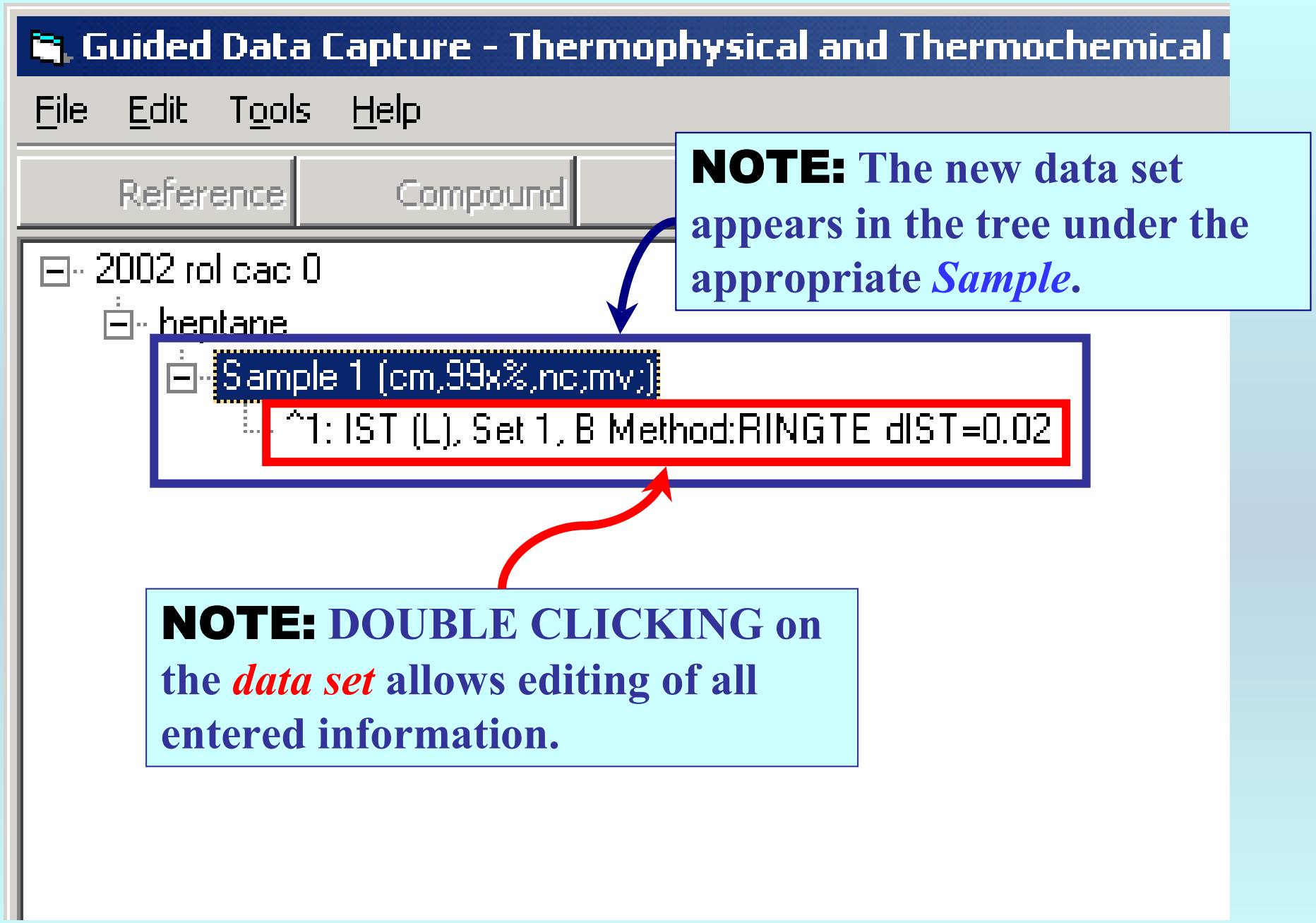

Property and experimental method for heptane
Help
Property gro
Property:
Units:
1. SELECT Method of Measurement from the list provided. NOTE: Other can be a valid selection and should include a brief description in the Comment field.
Method of measurement:
Ring tensiometer
Experimental purpose:
Principal objective of the work
2. SELECT the Experimental Purpose from the list provided.
Comment (optional)
NIMA DST 9005 tensiometer from NIMA Technology with Wilhelmy Plate or DuNuoy ring.
1-Variable data
3. CLICK 1-Variable data.
Cancel


1. SELECT the Units for the temperature, and enter the Uncertainty, if known.
Surface tension
Substance:
heptane
Sample #
1
Independent variable: Temperature
Temperature
Units:
K
Uncert
K
%
2. SELECT the Data Presentation;
Experimental Values
3. SELECT Phase 1 and Phase 2, as shown. TYPE the Precision of the Property Value, if known.
Data presentation
Experimental values
Property set #
1
Constraint:
Phase boundary
Phase 1:
Liquid
Phase 2:
Air at 1 atmosphere
Precision of the Property Value(s)
0.02
* 0.001 N/m
%
Comment to this record:
NIMA DST 9005
with Wilhelmy Plate or DuNuoy ring.
4. CLICK
Numerical Data
Numerical Data
Cancel


Surface tension liquid-gas (* 0.001 N/m) as function of 1 variable(s)
File Edit Action Help
Var 1 Property
1 293.15 20.53
2 303.15 19.49
3 313.15 18.50
4 323.15 17.44
5 333.15 16.50
1. TYPE, or much preferably, PASTE the variable and property values into the table.
Table 1. Pure Compone Data and Comparison with Literature
y/mN·m−1 ± 0.02 mN·m−1
n-alkane T/K this work Jasper3 McLure4 Jasper5 Koefoed6
n-C7H16 293.15 20.53 20.28 20.21 20.14 20.30
303.15 19.49 19.27 19.17 19.17 19.31
313.15 18.50 18.25 18.19 18.18
323.15 17.44 17.24 17.18 17.20
333.15 16.50 16.22 16.19 16.22
Clear the Table
View plot
Accept
Cancel
2. CLICK
View Plot


Surface tension liquid-gas as function of Temperature
Tools
Help
20.5
20
19.5
19
18.5
18
17.5
17
16.5
295
300
305
310
315
320
325
330
X = Var 1
OK
Check for typographical errors and CLICK *OK*, when done.


Surface tension liquid-gas (* 0.001 N/m) as function of 1 variable(s)
File Edit Action Help
Var 1 Property
1 293.15 20.53
2 303.15 19.49
3 313.15 18.50
4 323.15 17.44
5 333.15 16.50
CLICK Accept
Clear the Table
View plot
Accept
Cancel


Guided Data Capture - Thermophysical and Thermochemical
File Edit Tools Help
Reference
Compound
2002 rol cac 0
heptane
Sample 1 (cm,99x%,nc;mv;)
^1: IST (L), Set 1, B Method:RINGTE dIST=0.02
NOTE: The new data set appears in the tree under the appropriate Sample.
NOTE: DOUBLE CLICKING on the data set allows editing of all entered information.

END

Continue with other compounds, samples, properties, reactions, etc...

***or* save your file and exit the program.**