

1. Conditions

$$T_range := 273..274 = \begin{bmatrix} 273 \\ 274 \end{bmatrix}$$

$$P := 0.1, 0.2..0.2 = \begin{bmatrix} 0.1 \\ 0.2 \end{bmatrix}$$

$$P_range := P^T$$

%This portion allows the user to input range variables to define the pressure and temperature ranges. Temperature is placed in the first column of the Excel sheet while pressure is in the first row. Single values can also be selected by setting the range to the same beginning and end values.

2. Gas Properties

Alphabet_Caps := ["A" "B" "C" "D" "E" ...]

num2ltr(#) := Alphabet_Caps_{1,#}

Str_strtcell := "B2"

Str_col := num2ltr(cols(P_range)+1) = "C"

Str_row := num2str(rows(T_range)+1) = "3"

Read_range := concat(Str_strtcell, ":", Str_col, Str_row)

%This could be cleaned up and simplified with R1C1 formatting in Excel. This would mean that the columns could be referenced with numbers just like the rows. However, Mathcad does not seem to recognize this reference style as a valid input.

ArgonVisc := concat("ArgonVisc", "!", Read_range) = "ArgonVisc!B2:C3"

ArgonCond := concat("ArgonCond", "!", Read_range) = "ArgonCond!B2:C3"

HeliumVisc := concat("HeliumVisc", "!", Read_range) = "HeliumVisc!B2:C3"

HeliumCond := concat("HeliumCond", "!", Read_range) = "HeliumCond!B2:C3"

excel_{"ArgonVisc!B1"} := P_range

excel_{"HeliumVisc!B1"} := P_range

excel_{"ArgonVisc!A2"} := T_range

excel_{"HeliumVisc!A2"} := T_range

excel_{"ArgonCond!B1"} := P_range

excel_{"HeliumCond!B1"} := P_range

excel_{"ArgonCond!A2"} := T_range

excel_{"HeliumCond!A2"} := T_range

	0.1	0.2	0.3	1	1.25	1.5
273	146.1389	146.2166	146.2937	146.8209	147.0048	147.1867
274	146.5081	146.5857	146.6628	147.1896	147.3734	147.5551
274	146.5081	146.5857	146.6628	147.1896	147.3734	147.5551
276	147.2452	147.3228	147.3998	147.926	148.1094	148.2907
278	147.9808	148.0583	148.1352	148.6607	148.8438	149.0249
280	148.7148	148.7923	148.8691	149.394	149.5768	149.7575
282	149.4473	149.5247	149.6015	150.1257	150.3082	150.4886
284	150.1783	150.2556	150.3324	150.8559	151.0381	151.2181

Data_{ArgonVisc} := excel_{ArgonVisc}

Data_{HeliumVisc} := excel_{HeliumVisc}

Data_{ArgonCond} := excel_{ArgonCond}

Data_{HeliumCond} := excel_{HeliumCond}

$$Data_{ArgonVisc} = \begin{bmatrix} 21.01 & 21.03 \\ 21.07 & 21.09 \end{bmatrix}$$

$$Data_{HeliumVisc} = \begin{bmatrix} 18.69 & 18.69 \\ 18.73 & 18.74 \end{bmatrix}$$

$$Data_{ArgonCond} = \begin{bmatrix} 16.48 & 16.51 \\ 16.53 & 16.56 \end{bmatrix}$$

$$Data_{HeliumCond} = \begin{bmatrix} 146.14 & 146.22 \\ 146.51 & 146.59 \end{bmatrix}$$