Nach dem Öffnen des Files in Excel müssen die Makros aktiviert werden. Sollte das nicht gehen, müssen Sie zuvor Ihre Sicherheits-Einstellung verändern. Dazu gehen Sie auf Extras/Makro/Sicherheit und ändern die Einstellung auf "mittel". Danach File speichern, schließen und nochmals öffnen. Nun die Makros aktivieren.

```
' these variables are shared by all routines in this module
Dim ANT(3, 5) As Double
Dim VI(5) As Double
Dim PARAM(5, 5) As Double
Dim NK As Integer
Dim NK1 As Integer
Dim NST As Integer
Dim ITEXT As String
Dim ws As Object, wsfp As Object, wsfpd As Object, wsmfd As Object


    Public Sub desw_execute()
'   This program is based on UNIDIST developed in the group
'   of Prof. Aa. Fredenslund at the Technical University of Lyngby in Denmark
'   It was modified for Excel-VBA by Dr. J. Rarey, University of Oldenburg, Germany

'   IMPLICIT REAL*8 (A-H,O-Z)
    Dim P(50) As Double
    Dim XX(5) As Double
    Dim Index(50) As Integer
    Dim PROD(6) As Double
    Dim FEED(6) As Double
    Dim FL(50) As Double
    Dim FV(50) As Double
    Dim FLL(50, 5) As Double
    Dim T(50) As Double
    Dim BMAT(50, 7, 6) As Double
    Dim D(50, 6) As Double
    Dim CM(6, 13) As Double
    Dim Pi(5) As Double
    Dim DPI(5, 6) As Double
    Dim SL(50) As Double
    Dim SV(50) As Double
    Dim FKV(50) As Double
    Dim FSTR(50, 6) As Double

'   get current input sheet and set variables for output sheets
    Set ws = ActiveSheet
    Set wsfp = Sheets("Flux Profile")
    On Error GoTo 21
    Set wsfpd = Sheets("Flux Profile Diagram")
    Set wsmfd = Sheets("Mole Fraction Profile Diagram")
```

```
21: On Error GoTo 0
   If Not wsfpd Is Nothing Then wsfpd.Delete
   If Not wsmfd Is Nothing Then wsmfd.Delete



'  Clear Output-Sheets
   wsfp.Cells.ClearContents

'  number of components
   NK = ws.Cells(5, 2)

'  title text
   ITEXT = ws.Cells(6, 2)

'  Wilson parameters  PARAM(I,J) (U(J,I) - U(I,I))
   For i = 1 To NK
      For N = 1 To NK
         PARAM(i, N) = ws.Cells(17 + i, 1 + N)
      Next N
   Next i

'  molar volumes (CM3/MOL) and Antoine-constants (kPa)
   For i = 1 To NK
      VI(i) = ws.Cells(9 + i, 2)
      For k = 1 To 3
         ANT(k, i) = ws.Cells(9 + i, 2 + k)
      Next k
   Next i

   For i = 1 To NK
      ANT(1, i) = 2.3025851 * ANT(1, i)
      ANT(2, i) = 2.3025851 * ANT(2, i)
   Next i

   NST = ws.Cells(25, 2)
   NFEED = ws.Cells(26, 2)
   NSL = ws.Cells(27, 2)
   NSV = ws.Cells(28, 2)

   Index(1) = 1
   NSL1 = NSL + 1
   NSL2 = NSL + 2
   Index(NSL2 + NSV) = -NST
   IK = 1

'  EINGABE: DESTILLATMENGE, RUECKLAUFVERHAELTNIS, DRUCK IM KOPF
UND
'  SUMPF DER KOLONNE (KPA), SCHAETZWERTE FUER DIE TEMPERATUR AM
KOPF
```

```
'  UND IM SUMPF DER KOLONNE (C)
   DEST = ws.Cells(29, 2)
   RFLX = ws.Cells(30, 2)
   PT = ws.Cells(31, 2)
   PB = ws.Cells(32, 2)
   TT = ws.Cells(33, 2)
   TB = ws.Cells(34, 2)

'  FLMAX: MAXIMALE AENDERUNG DER STROEME (Z.B. 0.5), DTMAX: MAXI-
'  MALE TEMPERATURAENDERUNG WAEHREND DER ITERATION (Z.B. 10.)
   DTMAX = ws.Cells(35, 2)
   FLMAX = ws.Cells(36, 2)

   NK1 = NK + 1
   For i = 1 To NST
      P(i) = PB - (PB - PT) / CDbl(NST - 1) * CDbl(i - 1)
      SL(i) = 0#
      SV(i) = 0#
      FKV(i) = 0#
      FSTR(i, NK1) = 0#
      For j = 1 To NK
         FSTR(i, j) = 0#
      Next j
   Next i
   For i = 1 To NFEED
'     EINGABE DES ZULAUFBODENS, -BEDINGUNGEN UND -MENGEN
'     NF = ZULAUFBODEN
      NF = ws.Cells(39 + i, 2)
'     FKV = DAMPFANTEIL DES ZULAUFS
'     FSTR(NF,I) MENGE DER KOMPONENTE I IM ZULAUF
      FKV(NF) = ws.Cells(39 + i, 3)
      For j = 1 To NK
         FSTR(NF, j) = ws.Cells(39 + i, 3 + j)
      Next j
      For j = 1 To NK
         FSTR(NF, NK1) = FSTR(NF, NK1) + FSTR(NF, j)
      Next j
   Next i
   If NSL <> 0 Then
     For i = 1 To NSL
'       NLS = BODEN FUER DEN FLUESSIGEN SEITENSTROM
        NLS = ws.Cells(51 + i, 2)
        IK = IK + 1
        Index(IK) = NLS
'       SL = MENGE DES FLUESSIGEM SEITENSTROMS
        SL(NLS) = ws.Cells(51 + i, 3)
     Next i
   End If
   If NSV <> 0 Then
      For i = 1 To NSV
         IK = IK + 1
```

```
'         NVS = BODEN FUER DEN DAMPFFOERMIGEN SEITENSTROM
          NVS = ws.Cells(63 + i, 2)
          Index(IK) = -NVS
'         SV = MENGE DES DAMPFFOERMIGEN SEITENSTROMS
          SV(NVS) = ws.Cells(63 + i, 3)
        Next i
      End If
'   BERECHNUNG DER FLUESSIGKEITS- UND DAMPFSTROEME AUF DEN BOEDEN
'   (CONSTANT MOLAL OVERFLOW)
      FV(NST) = DEST + FKV(NST) * FSTR(NST, NK1)
      FL(NST) = DEST * RFLX + (1# - FKV(NST)) * FSTR(NST, NK1) - SL(NST)
      FV(NST - 1) = FL(NST) - FSTR(NST, NK1) + SV(NST) + SL(NST) + DEST
      For ii = 3 To NST
        If NST > 2 Then
          i = NST + 2 - ii
          FL(i) = FL(i + 1) - SL(i) + (1# - FKV(i)) * FSTR(i, NK1)
          FV(i - 1) = FV(i) + SV(i) - FKV(i) * FSTR(i, NK1)
        End If
      Next ii
      FL(1) = FL(2) - SL(1) + (1# - FKV(1)) * FSTR(1, NK1)
      FL(1) = FL(1) - FV(1)
        For j = 1 To NK1
          FEED(j) = 0#
          For i = 1 To NST
            FEED(j) = FEED(j) + FSTR(i, j)
          Next i
        Next j


'   ERSTE ABSCHAETZUNG DES TEMPERATUR- UND KONZENTRATIONSPROFILS
      For i = 1 To NST
        T(i) = TB + (i - 1) * (TT - TB) / NST
      Next i

'   IRES = EXPONENT FUER DAS ABBRUCHKRITERIUM RLIM= 10.D00**(-IRES)
      IRES = ws.Cells(37, 2)
      rlim = 10# ^ (-IRES)

      For i = 1 To NST
        For j = 1 To NK
          FLL(i, j) = FEED(j) / FEED(NK1) * FL(i)
        Next j
      Next i

      NIT = 0
      res = 10# * rlim
      While res > rlim
        NKA = NK - 1
        NIT = NIT + 1

'     BERECHNUNG DER AKTIVITAETSKOEFFIZIENTEN UND DER ABLEITUNG
```

```
'    NACH DER TEMPERATUR UND DER MOLMENGEN
     For i = 1 To NST
      For j = 1 To NK
       XX(j) = FLL(i, j)
      Next j

       FLSUM = FL(i)

       Call WILSON(T(i), XX, Pi, DPI, FLSUM)

       For j = 1 To NK
        For k = 1 To NKA
           BMAT(i, j, k) = (DPI(j, k) - DPI(j, NK)) / P(i)
        Next k
        BMAT(i, j, NK) = DPI(j, NK + 1) / P(i)
        BMAT(i, NK + 1, j) = Pi(j) / P(i)
       Next j
     Next i
'200  CONTINUE

     For IK = 1 To NST
      i = NST + 1 - IK
      ip = 2 * NK + 1
      If i = 1 Then ip = NK + 1
      D(i, NK) = -1 + BMAT(i, NK + 1, NK)
      For j = 1 To NKA
       D(i, NK) = D(i, NK) + BMAT(i, NK + 1, j)
       D(i, j) = FSTR(i, j) - FLL(i, j) * (1 + SL(i) / FL(i))
       D(i, j) = D(i, j) - BMAT(i, NK1, j) * (FV(i) + SV(i))
       If i <> 1 Then D(i, j) = D(i, j) + BMAT(i - 1, NK1, j) * FV(i - 1)
       If i <> NST Then D(i, j) = D(i, j) + FLL(i + 1, j)
'      AUFSTELLEN DER JACOBI-MATRIX UND LOESUNG DER TRIDIAGONALEN
'      MATRIX DURCH GAUSSSCHE ELIMINIERUNG
       For k = 1 To NK
        If i <> 1 Then CM(j, k + NK) = BMAT(i - 1, j, k) * FV(i - 1)
        CM(j, k) = -BMAT(i, j, k) * (FV(i) + SV(i))
       Next k
      Next j
      For j = 1 To NKA
         CM(j, j) = CM(j, j) - 1 - SL(i) / FL(i)
      Next j
      For j = 1 To NK
         CM(NK, j) = 0#
         CM(NK, j + NK) = 0#
         CM(j, ip) = D(i, j)
         For k = 1 To NK
            CM(NK, j) = CM(NK, j) + BMAT(i, k, j)
         Next k
      Next j

      If i <> NST Then
```

```
            For j = 1 To NKA
               CM(j, ip) = CM(j, ip) - D(i + 1, j)
               For k = 1 To NK
                  CM(j, k) = CM(j, k) - BMAT(i + 1, j, k)
               Next k
            Next j
         End If
         Call GAUSL(6, 13, NK, ip - NK, CM)

         For j = 1 To NK
            D(i, j) = CM(j, ip)
            If i <> 1 Then
            For k = 1 To NK
               BMAT(i, j, k) = CM(j, k + NK)
            Next k
            End If
         Next j

'300   CONTINUE
      Next IK

      For i = 2 To NST
        For j = 1 To NK
          For k = 1 To NK
            D(i, j) = D(i, j) - BMAT(i, j, k) * D(i - 1, k)
          Next k
        Next j
      Next i

      res = 0#
'     AENDERUNG DER UNABHAENGIGEN VARIABLEN NACH DER NEWTON-
RAPHSON METHODE
       For i = 1 To NST
         Q = Abs(D(i, NK) / DTMAX)
         If Q > 1# Then D(i, NK) = D(i, NK) / Q
         T(i) = T(i) - D(i, NK)
         D(i, NK) = 0#
         FLM = FLMAX * FL(i)
         For j = 1 To NKA
            D(i, NK) = D(i, NK) - D(i, j)
         Next j
         Sum = 0#
         For j = 1 To NK
            Q = Abs(D(i, j) / FLM)
'           BERECHNUNG DER FEHLERQUADRATSUMME
            res = res + Q * Q
            If Q > 1# Then D(i, j) = D(i, j) / Q
            FLL(i, j) = FLL(i, j) - D(i, j)
            If FLL(i, j) < 0# Then FLL(i, j) = 0#
            Sum = Sum + FLL(i, j)
         Next j
```

```
        Q = FL(i) / Sum
        For j = 1 To NK
           FLL(i, j) = FLL(i, j) * Q
        Next j
    Next i
'     WRITE (NAG,502) RES,T(1),T(NST)
'  502 FORMAT(/,' WERT DER ZIELFUNKTION=',E12.3,'   TB =',E12.3,'   TT ='
'     1,E12.3)
'C     UEBERPRUEFUNG DES ABBRUCHKRITERIUMS
Wend

' write flux report column header
wsfp.Cells(1, 1) = "Calculation Output"
wsfp.Cells(3, 1) = "Stage"
wsfp.Cells(3, 2) = "Temperature"
wsfp.Cells(4, 2) = "°C"
wsfp.Cells(3, 3) = "Pressure"
wsfp.Cells(4, 3) = "kPa"
wsfp.Cells(3, 4) = "Total Liquid Flux"
wsfp.Cells(4, 4) = "same as in-unit"
wsfp.Cells(3, 5) = "Component Liquid Flux"
For i = 1 To NK
   wsfp.Cells(4, 4 + i) = "comp. " & i
Next i
wsfp.Cells(3, 5 + NK) = "Component Liquid Mole Fraction"
For i = 1 To NK
   wsfp.Cells(4, 4 + NK + i) = "x" & i
Next i

' write flux report
For i = 1 To NST
   wsfp.Cells(4 + i, 1) = i
   wsfp.Cells(4 + i, 2) = T(i)
   wsfp.Cells(4 + i, 3) = P(i)
   wsfp.Cells(4 + i, 4) = FL(i)
   Suml = 0
   For j = 1 To NK
      wsfp.Cells(4 + i, 4 + j) = FLL(i, j)
      Suml = Suml + FLL(i, j)
   Next j
   For j = 1 To NK
      wsfp.Cells(4 + i, 4 + NK + j) = FLL(i, j) / Suml
   Next j
Next i


Worksheets("Product Streams").Cells.ClearContents
Worksheets("Product Streams").Cells(1, 1) = "Product Streams"
Worksheets("Product Streams").Cells(3, 1) = "Liquid Product Streams"
Worksheets("Product Streams").Cells(4, 1) = "stage"
Worksheets("Product Streams").Cells(4, 2) = "component streams"
```

```
For j = 1 To NSL1
   i = Index(j)
   Q = 1#
   If i <> 1 Then Q = SL(i) / FL(i)
   For k = 1 To NK
      PROD(k) = Q * FLL(i, k)
   Next k
   Worksheets("Product Streams").Cells(4 + j, 1) = i
   For k = 1 To NK
      Worksheets("Product Streams").Cells(4 + j, 1 + k) = PROD(k)
   Next k
Next j

Worksheets("Product Streams").Cells(4 + NSL1 + 2, 1) = "Vapor Product Streams"
Worksheets("Product Streams").Cells(4 + NSL1 + 3, 1) = "stage"
Worksheets("Product Streams").Cells(4 + NSL1 + 3, 2) = "component streams"

NSLT = NSL2 + NSV
lline = 4 + NSL1 + 3
For j = NSL2 To NSLT
   lline = lline + 1
   i = -Index(j)
   Q = 1#
   If i <> NST Then Q = SV(i) / FV(i)
   Worksheets("Product Streams").Cells(lline, 1) = i
   For k = 1 To NK
      PROD(k) = Q * BMAT(i, NK1, k) * FV(i)
      Worksheets("Product Streams").Cells(lline, 1 + k) = PROD(k)
   Next k
Next j
Call format_results
Charts("Flux Profile Diagram").Activate
End Sub

     Sub WILSON(TEMP, FL, Pi, DPI, FLSUM)
'    DAS UNTERPROGRAMM WILSON ERLAUBT DIE BERECHNUNG DER
PARTIAL-
'    DRUECKE UND DER ABLEITUNGEN NACH DER TEMPERATUR UND DER
MOLMEN
'    GEN ( BASIS: WILSON- UND ANTOINE-GLEICHUNG)
'    DIE UEBERGABEPARAMETER HABEN DIE FOLGENDE BEDEUTUNG:
'    TEMP  TEMPERATUR  C
'    FL(I)  MOLMENGEN DER KOMPONENTE I  I=1,2..NK
'    GAM(I) AKTIVITAETSKOEFFIZIENT BERECHNET MIT DER WILSON-
GLEICHUNG
'    PI(I) PARTIALDRUCK DER KOMPONENTE I
'    DPI(I,J) ABLEITUNG VON PI(I) GENERATED IN WILSON
'    FUER J=1,2..NK SIND ES DIE ABLEITUNGEN NACH DEN MOLMENGEN
'    FUER J=NK+1 SIND ES DIE ABLEITUNGEN NACH DER TEMPERATUR
```

```
'    IMPLICIT REAL*8 (A-H,O-Z)
     Dim GAM(5), PRS(5), DPRS(5), WLAM(5, 5)
'!!!!!     COMMON/DIST/ANT(3,5),VI(5),PARAM(5,5),NK,NK1
     For i = 1 To NK
       PRS(i) = Exp(ANT(1, i) - ANT(2, i) / (ANT(3, i) + TEMP))
       DPRS(i) = ANT(2, i) / (ANT(3, i) + TEMP) ^ 2
     Next i
     TEMK = TEMP + 273.15

     For i = 1 To NK
       For j = 1 To NK
          WLAM(i, j) = VI(j) / VI(i) * Exp(-PARAM(i, j) / TEMK)
       Next j
     Next i

     For i = 1 To NK
     A1 = 0#
     A2 = 0#
     A3 = 0#
     A4 = 0#
     For k = 1 To NK
          A5 = 0#
          A6 = 0#
          A1 = A1 + FL(k) * WLAM(i, k)
          A2 = A2 + FL(k) * WLAM(i, k) * PARAM(i, k) / TEMK ^ 2
          For j = 1 To NK
             A5 = A5 + FL(j) * WLAM(k, j)
             A6 = A6 + FL(j) * WLAM(k, j) * PARAM(k, j) / TEMK ^ 2
          Next j
          A3 = A3 + FL(k) * WLAM(k, i) / A5
          A4 = A4 + FL(k) * WLAM(k, i) * PARAM(k, i) / TEMK ^ 2 / A5
          A4 = A4 - FL(k) * WLAM(k, i) * A6 / A5 ^ 2
       Next k
       GAM(i) = Exp(-Log(A1 / FLSUM) + 1# - A3)
       Pi(i) = FL(i) / FLSUM * GAM(i) * PRS(i)
       DPI(i, NK1) = Pi(i) * (-A2 / A1 - A4 + DPRS(i))
       For L = 1 To NK
          A7 = 0#
          A9 = 0#
          For k = 1 To NK
             A8 = 0#
             A9 = A9 + FL(k) * WLAM(L, k)
             For j = 1 To NK
                A8 = A8 + FL(j) * WLAM(k, j)
             Next j
             A7 = A7 + FL(k) * WLAM(k, i) * WLAM(k, L) / A8 ^ 2
          Next k
          DPI(i, L) = -WLAM(i, L) / A1 - WLAM(L, i) / A9 + A7
       Next L
     Next i
```

```
      For i = 1 To NK
        For L = 1 To NK
           S = DPI(i, L) * FL(i)
           If L = i Then S = S + 1
           DPI(i, L) = PRS(i) * GAM(i) / FLSUM * S
        Next L
      Next i
      End Sub
Sub GAUSL(ND, NCOL, N, NS, A)
'     DAS  UNTERPROGRAMM GAUSL LOEST N LINEARE  ALGEBRAISCHE
 GLEICHUNGEN
'     DURCH GAUSSSCHE ELIMINIERUNG
'      IMPLICIT REAL*8 (A-H,O-Z)
'ReDim A(ND, NCOL)
N1 = N + 1
NT = N + NS
If N <> 1 Then
   For i = 2 To N
      ip = i - 1
      i1 = ip
      X = Abs(A(i1, i1))
      For j = i To N
        If Abs(A(j, i1)) >= X Then
          X = Abs(A(j, i1))
          ip = j
        End If
      Next j
      If ip <> i1 Then
         For j = i1 To NT
            X = A(i1, j)
            A(i1, j) = A(ip, j)
            A(ip, j) = X
         Next j
      End If
      For j = i To N
         X = A(j, i1) / A(i1, i1)
         For k = i To NT
            A(j, k) = A(j, k) - X * A(i1, k)
         Next k
      Next j
   Next i
End If
   For ip = 1 To N
      i = N1 - ip
      For k = N1 To NT
        A(i, k) = A(i, k) / A(i, i)
        If i <> 1 Then
          i1 = i - 1
          For j = 1 To i1
             A(j, k) = A(j, k) - A(i, k) * A(j, i)
          Next j
```

```
        End If
      Next k
    Next ip
End Sub

Private Sub format_results()

' format flux profile report sheet
    Sheets("Flux Profile").Select
    Range("A1").Select
    With Selection.Font
        .Name = "Arial"
        .Size = 16
        .Strikethrough = False
        .Superscript = False
        .Subscript = False
        .OutlineFont = False
        .Shadow = False
        .Underline = xlUnderlineStyleNone
        .ColorIndex = xlAutomatic
    End With
    Selection.Font.Bold = True

    Range("A3:O3").Select
    With Selection.Interior
        .ColorIndex = 34
        .Pattern = xlSolid
    End With

    Columns("B:B").Select
    Selection.NumberFormat = "0.000"
    Columns("C:C").Select
    Selection.NumberFormat = "0.000"
    Columns("D:D").Select
    Selection.NumberFormat = "0.00"
    Columns("E:O").Select
    Selection.NumberFormat = "0.00000"
    Range("A3:I100").Select

' add chart
    Charts.Add
    Dim ser As Object
    ActiveChart.ChartType = xlXYScatterLines
    On Error Resume Next
    For Each ser In ActiveChart.SeriesCollection
        ser.Delete
    Next ser
    On Error GoTo 0

' select chart data
    undels = ActiveChart.SeriesCollection.Count
```

```
    With ActiveChart
        ' Total Flux Curve
        .SeriesCollection.NewSeries
        .SeriesCollection(undels + 1).XValues = "='" & wsfp.Name & "'!R" & CInt(5) & "C1:
R" & CInt(4 + NST) & "C1 "
        .SeriesCollection(undels + 1).Values = "='" & wsfp.Name & "'!R" & CInt(5) & "C4: R"
& CInt(4 + NST) & "C4 "
        .SeriesCollection(undels + 1).Name = "='" & wsfp.Name & "'!R3C4"

        ' Component Flux Curves
        For i = 1 To NK
            .SeriesCollection.NewSeries
            .SeriesCollection(undels + 1 + i).XValues = "='" & wsfp.Name & "'!R" & CInt(5) &
"C1: R" & CInt(4 + NST) & "C1 "
            .SeriesCollection(undels + 1 + i).Values = "='" & wsfp.Name & "'!R" & CInt(5) &
"C" & CInt(4 + i) & ": R" & CInt(4 + NST) & "C" & CInt(4 + i)
            .SeriesCollection(undels + 1 + i).Name = "='" & wsfp.Name & "'!R4C" & CInt(4 + i)
        Next i
    End With
    ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="Flux Profile Diagram"

    With ActiveChart
        .HasTitle = True
        .ChartTitle.Characters.Text = "Column Profile (Flux)" & Chr(10) & ITEXT
        .Axes(xlCategory, xlPrimary).HasTitle = True
        .Axes(xlCategory, xlPrimary).AxisTitle.Characters.Text = "stage number"
        .Axes(xlValue, xlPrimary).HasTitle = True
        .Axes(xlValue, xlPrimary).AxisTitle.Characters.Text = "flux (input unit)"
    End With
    With ActiveChart.Axes(xlCategory)
        .HasMajorGridlines = True
        .HasMinorGridlines = False
    End With
    With ActiveChart.Axes(xlValue)
        .HasMajorGridlines = True
        .HasMinorGridlines = False
    End With
    ActiveChart.Axes(xlValue).Select
    Selection.TickLabels.NumberFormat = "0.00"
    ActiveChart.ApplyDataLabels Type:=xlDataLabelsShowNone, LegendKey:=False

    With ActiveChart.Axes(xlCategory)
        .MinimumScale = 1
        .MaximumScale = NST
        .MinorUnitIsAuto = True
        .MajorUnitIsAuto = True
        .Crosses = xlAutomatic
        .ReversePlotOrder = False
        .ScaleType = xlLinear
        .DisplayUnit = xlNone
    End With
```

```
    For Each ser In ActiveChart.SeriesCollection
        With ser.Border
            .ColorIndex = 57
            .Weight = xlMedium
            .LineStyle = xlContinuous
        End With
    Next ser
    Sheets("Product Streams").Select

' Mole Fraction Profile ----------------------------------------------------------------------------------------
----

' add chart
    Charts.Add
    ActiveChart.ChartType = xlXYScatterLines
    On Error Resume Next
    For Each ser In ActiveChart.SeriesCollection
        ser.Delete
    Next ser
    On Error GoTo 0

' select chart data
    undels = ActiveChart.SeriesCollection.Count
    With ActiveChart

        ' Component mole fraction Curves
        For i = 1 To NK
            .SeriesCollection.NewSeries
            .SeriesCollection(undels + i).XValues = "='" & wsfp.Name & "'!R" & CInt(5) & "C1:
R" & CInt(4 + NST) & "C1 "
            .SeriesCollection(undels + i).Values = "='" & wsfp.Name & "'!R" & CInt(5) & "C" &
CInt(4 + NK + i) & ": R" & CInt(4 + NST) & "C" & CInt(4 + NK + i)
            .SeriesCollection(undels + i).Name = "='" & wsfp.Name & "'!R4C" & CInt(4 + NK +
i)
        Next i
    End With
    ActiveChart.Location Where:=xlLocationAsNewSheet, Name:="Mole Fraction Profile
Diagram"

    With ActiveChart
        .HasTitle = True
        .ChartTitle.Characters.Text = "Column Profile (Mole Fraction)" & Chr(10) & ITEXT
        .Axes(xlCategory, xlPrimary).HasTitle = True
        .Axes(xlCategory, xlPrimary).AxisTitle.Characters.Text = "stage number"
        .Axes(xlValue, xlPrimary).HasTitle = True
        .Axes(xlValue, xlPrimary).AxisTitle.Characters.Text = "mole fraction"
    End With
    With ActiveChart.Axes(xlCategory)
        .HasMajorGridlines = True
```

```
    .HasMinorGridlines = False
End With
With ActiveChart.Axes(xlValue)
    .HasMajorGridlines = True
    .HasMinorGridlines = False
End With
ActiveChart.Axes(xlValue).Select
Selection.TickLabels.NumberFormat = "0.00"
ActiveChart.ApplyDataLabels Type:=xlDataLabelsShowNone, LegendKey:=False

With ActiveChart.Axes(xlCategory)
    .MinimumScale = 1
    .MaximumScale = NST
    .MinorUnitIsAuto = True
    .MajorUnitIsAuto = True
    .Crosses = xlAutomatic
    .ReversePlotOrder = False
    .ScaleType = xlLinear
    .DisplayUnit = xlNone
End With
With ActiveChart.Axes(xlValue)
    .MinimumScale = 0
    .MaximumScale = 1
    .MinorUnitIsAuto = True
    .MajorUnitIsAuto = True
    .Crosses = xlAutomatic
    .ReversePlotOrder = False
    .ScaleType = xlLinear
    .DisplayUnit = xlNone
End With


For Each ser In ActiveChart.SeriesCollection
    With ser.Border
        .ColorIndex = 57
        .Weight = xlMedium
        .LineStyle = xlContinuous
    End With
Next ser




Sheets("Product Streams").Select
Range("A1").Select
With Selection.Font
    .Name = "Arial"
    .Size = 16
    .Strikethrough = False
    .Superscript = False
```

```
        .Subscript = False
        .OutlineFont = False
        .Shadow = False
        .Underline = xlUnderlineStyleNone
        .ColorIndex = xlAutomatic
    End With

    Selection.Font.Bold = True
    Range("A3").Select

End Sub

Public Sub desw_prepare_sheets()
'    On Error Resume Next
'    Sheets("Flux Profile").Add
'    Sheets("Product Streams").Add
'    Sheets("desw_in").Add
'    On Error GoTo 0
    Sheets("desw_in").Select
    Cells.Select
    Selection.Clear

    With ws
        .Cells(1, 1) = "Distillation (Naphthali-Sandholm) Using the Wilson-Model"
        .Cells(2, 1) = "based on code given in 'Grundoperationen' (Gmehling, Brehm)"
        .Cells(4, 1) = "General Information"
        .Cells(5, 1) = "Number of components:"
        .Cells(6, 1) = "Title"
        .Cells(8, 1) = "Pure Component Data"
        .Cells(9, 1) = "Molar volume, Antoine constants (P [kPa] = 10^(A-B/(C+T[°C]))"
        .Cells(9, 2) = "vL"
        .Cells(9, 3) = "A"
        .Cells(9, 4) = "B"
        .Cells(9, 5) = "C"
        .Cells(16, 1) = "Interaction Parameters (Wilson, K)"
        .Cells(17, 2) = "1"
        .Cells(17, 3) = "2"
        .Cells(17, 4) = "3"
        .Cells(17, 5) = "4"
        .Cells(17, 6) = "5"
        .Cells(18, 1) = "1"
        .Cells(19, 1) = "2"
        .Cells(20, 1) = "3"
        .Cells(21, 1) = "4"
        .Cells(22, 1) = "5"
        .Cells(18, 2) = "0"
        .Cells(19, 3) = "0"
        .Cells(20, 4) = "0"
        .Cells(21, 5) = "0"
        .Cells(22, 6) = "0"
        .Cells(24, 1) = "Column Configuration (Stage 1 is the Reboiler)"
```

```
        .Cells(25, 1) = "Number of stages (max. 50)"
        .Cells(26, 1) = "Number of feeds"
        .Cells(27, 1) = "Number of liquid side streams"
        .Cells(28, 1) = "Number of vapor side streams"
        .Cells(29, 1) = "Destillate flux"
        .Cells(30, 1) = "Reflux ratio"
        .Cells(31, 1) = "Top pressure (kPa)"
        .Cells(32, 1) = "Button pressure (kPa)"
        .Cells(33, 1) = "Top temperature estimate ( C)"
        .Cells(34, 1) = "Buttom temperature estimate ( C)"
        .Cells(35, 1) = "FLMAX"
        .Cells(36, 1) = "DTMAX"
        .Cells(37, 1) = "Exponent of convergence criterion"
        .Cells(39, 1) = "Feeds"
        .Cells(39, 2) = "stage"
        .Cells(39, 3) = "q"
        .Cells(39, 4) = "n1"
        .Cells(39, 5) = "n2"
        .Cells(39, 6) = "n3"
        .Cells(39, 7) = "n4"
        .Cells(39, 8) = "n5"
        .Cells(40, 1) = "1"
        .Cells(41, 1) = "2"
        .Cells(42, 1) = "3"
        .Cells(43, 1) = "4"
        .Cells(44, 1) = "5"
        .Cells(45, 1) = "6"
        .Cells(46, 1) = "7"
        .Cells(47, 1) = "8"
        .Cells(48, 1) = "9"
        .Cells(49, 1) = "10"
    End With
    Range("A1").Select
    With Selection.Font
        .Name = "Arial"
        .Size = 16
        .Strikethrough = False
        .Superscript = False
        .Subscript = False
        .OutlineFont = False
        .Shadow = False
        .Underline = xlUnderlineStyleNone
        .ColorIndex = xlAutomatic
    End With
    Selection.Font.Bold = True
    Range("A1:F1").Select
    With Selection.Interior
        .ColorIndex = 34
        .Pattern = xlSolid
    End With
    Range("A4:F4").Select
```

```
With Selection.Interior
    .ColorIndex = 33
    .Pattern = xlSolid
End With
Range("A8:F8").Select
With Selection.Interior
    .ColorIndex = 33
    .Pattern = xlSolid
End With
Range("A16:F16").Select
With Selection.Interior
    .ColorIndex = 33
    .Pattern = xlSolid
End With
Range("A24:F24").Select
With Selection.Interior
    .ColorIndex = 33
    .Pattern = xlSolid
End With
Range("A39:H39").Select
With Selection.Interior
    .ColorIndex = 33
    .Pattern = xlSolid
End With
Range("A5:A6").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("A9:A14").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("A17:A22").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("B17:F17").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("A25:A37").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("A40:A49").Select
With Selection.Interior
```

```
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("B18:F22").Select
Selection.NumberFormat = "0.0000"
Range("B18").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("C19").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("D20").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("E21").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
Range("F22").Select
With Selection.Interior
    .ColorIndex = 34
    .Pattern = xlSolid
End With
ActiveWindow.ScrollRow = 1
Range("A1:F1").Select
Selection.Interior.ColorIndex = 37
Selection.Interior.ColorIndex = 33
Range("A2").Select
Selection.Font.Italic = True
Range("H7").Select
Columns("A:A").ColumnWidth = 27.89
Columns("B:I").Select
With Selection
    .HorizontalAlignment = xlCenter
    .VerticalAlignment = xlBottom
    .WrapText = False
    .Orientation = 0
    .AddIndent = False
    .ShrinkToFit = False
    .MergeCells = False
End With
Range("A10").Select
ActiveCell.FormulaR1C1 = "1"
Range("A11").Select
```

```
    ActiveCell.FormulaR1C1 = "2"
    Range("A12").Select
    ActiveCell.FormulaR1C1 = "3"
    Range("A13").Select
    ActiveCell.FormulaR1C1 = "4"
    Range("A14").Select
    ActiveCell.FormulaR1C1 = "5"
    Range("B15").Select
    ActiveWindow.ScrollRow = 7
End Sub
```