APPENDICES

APPENDIX A – The Fortran Code for the Statistical Thermodynamical Calculations

```fortran
! *********************************************************************
PROGRAM StWater
! *********************************************************************
!                                                                    *
! This program:                                                      *
!                                                                    *
! – Calculates the partition functions for 1-, 2-, 3-, 4- H-bonded   *
!   and non-bonded water species at given mole fractions and         *
!   temperature.                                                     *
! – Finds the optimum values for the mole fractions of above given   *
!   species by maximizing the natural logarithm of the canonical     *
!   partition function of the whole system with respect to ice-like  *
!   patch-size "g", H-bond formation probability "p" and the mole    *
!   fraction of ice-like water molecules "Xi".                       *
! – Calculates the the chemical potentials and molar volumes of the  *
!   ice, liquid water and hypothetical lattice defect phases.        *
! – Writes out the results of calculations in a separate ".txt" file.*
!                                                                    *
!          For the subroutine DAT.for refer to :                    *
!     Numerical Implementation and Oceanographic Application         *
!                of the Gibbs Potential of Ice                       *
!         by R.Feistel, W.Wagner, V.Tchijov, C.Guder                 *
!               Ocean Science, 1 (2005), 29-38                       *
!                                                                    *
! *********************************************************************


      IMPLICIT REAL *8 (A-I,L-Z)

      DOUBLE precision, Parameter :: NA = 6.022D+23
      DOUBLE precision, Parameter :: pi = 3.1415926535

      DOUBLE precision :: PartFunc
      DOUBLE precision :: T, Tc, pascal
! --> T: Temperature in Kelvin
! --> Tc: Temperature in Celcius
      DOUBLE precision :: pf_0, pf_1, pf_2, pf_3, pf_4
      DOUBLE precision :: deg, logZ
      DOUBLE precision :: g, g2, g3, g4
! --> g is the patch size in terms of number of constituting
! --> ice-like water molecules.
      DOUBLE precision :: xi, p
      DOUBLE precision :: f, f0, f1, f2, f3, f4
      DOUBLE precision :: g_2_3, g_2_4, g_3_4, n2, n3, n4
      DOUBLE precision :: n_T, h1, h2, h3, h4, h0
      DOUBLE precision :: patch_size, cnn, fr_ice, lnZ, xu, x1, x2, x3,x4

      DOUBLE precision :: Vm, Vm_ice, Vm_blk, vblk, n_p, n_b
      DOUBLE precision :: Mu_Ice, Mu_Liq, delta_Mu, Mu_Blk, radius

      INTEGER :: i, j, k
```

```fortran
      COMMON /INPUT/ T

! --> Initialization of necessary parameters:
      CALL DAT
      T = 237.15
      Tc = T - 273.15
      pascal = 101325.D0
      lnZ = 0.00

! --> Calculate partition function terms at a given temperature T:
      pf_0 = PartFunc(0)
      pf_1 = PartFunc(1)
      pf_2 = PartFunc(2)
      pf_3 = PartFunc(3)
      pf_4 = PartFunc(4)

! --> Maximize the canonical partition function
! --> with respect to mol fractions of different H-bonded species:
      DO i = 1, 3000

        g = 13.0 + 1.0 * i
        g2 = 2.621 * g**(1.0/3.0)
        g3 = 3.434 * g**(2.0/3.0) - 5.241 * g**(1.0/3.0)
        g4 = g - g2 - g3

        DO j = 1, 99

          P = 0.01 * j
          ! --> p is the H-bond formation probability of the bulk molecules.
          ! --> Calculate the fraction of j bonded molecules in the bulk.
          f0 = (1.0 - p)**4.0
          f1 = 4.0 * p * (1.0 - p)**3.0
          f2 = 6.0 * p**2.0 * (1.0 - p)**2.0
          f3 = 4.0 * p**3.0 * (1.0 - p)
          f4 = p**4.0

          ! --> Re-calculate the H-bonding states of molecules
          ! --> on the surface of the patches.
          g_2_3 = 2.0 * p * g2 * (1.0 - p)
          g_2_4 = g2 * p**2.0
          g_3_4 = g3 * p

          n2 = g2 - g_2_3 - g_2_4
          n3 = g3 - g_3_4 + g_2_3
          n4 = g4 + g_2_4 + g_3_4

          DO k = 1, 99

            xi = 0.01 * k
            ! --> xi is the mole fraction of molecules belonging to ice-like
            ! --> patches.

            ! --> Calculate the final mole fractions of each H-bonding species
            h0 = (1.0 - xi) * f0
            h1 = (1.0 - xi) * f1
            h2 = (1.0 - xi) * f2 + xi * (n2/g)
            h3 = (1.0 - xi) * f3 + xi * (n3/g)
            h4 = (1.0 - xi) * f4 + xi * (n4/g)
```

```fortran
            deg = NA*(log(NA) - 1.0) - NA*h1*(log(NA * h1) - 1.0)
            deg = deg - NA*h2*(log(NA * h2) - 1.0) - NA*h3*(log(NA * h3) - 1.0)
            deg = deg - NA*h4*(log(NA * h4) - 1.0) - NA*h0*(log(NA * h0) - 1.0)

            logZ = deg + NA*h4*log(pf_4) + NA*h3*log(pf_3) + NA*h2*log(pf_2) +
                   NA*h1*log(pf_1) + NA*h0*log(pf_0)

            IF (lnZ < logZ) THEN
               lnZ = logZ
               patch_size = g
               fr_ice = xi
               cnn = p
               xu = h0
               x1 = h1
               x2 = h2
               x3 = h3
               x4 = h4
            END IF

         END DO
      END DO
END DO


!***********************************************************************
! --> Calculate the molar volume of ice:
Vm_ice = ice_specific_volume(T, pascal)   ! --> in m**3/kg
Vm_ice = Vm_ice * 18.015/1000.0           ! --> in m**3/mole

! --> Calculate the molar volume Vm of supercooled liquid water
! --> in cubic meters at a given temperature T:
Vm = 0.99986 + 6.69D-5*Tc - 8.486D-6*Tc**2.0 + 1.518D-7*Tc**3.0
Vm = Vm - 6.9484D-9*Tc**4.0 - 3.6449D-10*Tc**5.0 - 7.497D-12*Tc**6.0 ! in g/ml
Vm = 18.015D-6 / Vm                                                  ! in m**3

! --> Calculate the molar volume of the bulk
! --> molecules in cubic meters:
Vm_blk = (Vm - Vm_ice * fr_ice) / (1.0 - fr_ice)

!***********************************************************************
! --> Calculate the chemical potential of ice:
Mu_Ice = ice_g (T, pascal) * 18.015D-6        ! --> in kJ/mol

! --> Calculate the chemical potential of water:
delta_Mu = (210368.0 + 131.438*T - 3.32373D6/T - 41729.1*log(T)) * 1.0D-3  ! -
-> mIce - muL, kJ/mol

! --> Calculate the chemical potential of water (ST calculations):
Mu_Liq = -1.38D-23 * T * lnZ * 1.0D-3

! --> Calculate the chemical potential of bulk (ST calculations):
h0 = (1.0 - cnn)**4.0
h1 = 4.0 * cnn * (1.0 - cnn)**3.0
h2 = 6.0 * cnn**2.0 * (1.0 - cnn)**2.0
h3 = 4.0 * cnn**3.0 * (1.0 - cnn)
h4 = cnn**4.0

deg = NA*(log(NA) - 1.0) - NA*h1*(log(NA * h1) - 1.0) - NA*h2*(log(NA * h2) - 1.0)
deg = deg - NA*h3*(log(NA * h3) - 1.0) - NA*h4*(log(NA * h4) - 1.0) - NA*h0*(log(NA * h0) - 1.0)
```

```fortran
logZ = deg + NA*h4*log(pf_4) + NA*h3*log(pf_3) + NA*h2*log(pf_2) +
NA*h1*log(pf_1) + NA*h0*log(pf_0)

Mu_Blk = -1.38D-23 * T * logZ * 1.0D-3

!************************************************************************
! Calculate the hard-sphere radius of ice (half the  O-O distance):
radius = Vm_ice * 1.0D7 / (6.02 * 4.0 * pi)
radius = radius**0.3333

! --> Calculate the packing volume of a bulk molecule in A**3:
vblk = Vm_blk*1.0D7/6.02

!************************************************************************

! --> number of bulk molecules per ice-like patch:
n_b = (1.0 - fr_ice) * patch_size / fr_ice

!************************************************************************
! --> Write out the results of the computations to a file:

OPEN (10, file = "results.txt", status = 'unknown')
WRITE (10, '(A)') 'Results of the statistical thermodynamical calculations'
WRITE (10, '(A)') 'on the structure of water:'
WRITE (10, '(A)') '-------------------------------------------------------'
WRITE (10, '(A)')' '
WRITE (10, '(A, F6.2)') 'Temperature = ', Tc
WRITE (10, '(A, E10.4)') 'Vm-ice = ', Vm_ice
WRITE (10, '(A, E10.4)') 'Vm-liq. = ', Vm
WRITE (10, '(A, E10.4)') 'Vm-blk. = ', Vm_blk
WRITE (10, '(A, F8.4)') 'Hard-sphere radius of an ice molecule = ', radius
WRITE (10, '(A, F8.4)') 'Packing  volume of a bulk molecule = ', vblk
WRITE (10, '(A)') 'Mole fraction of molecules belonging'
WRITE (10, '(A, F5.3)') 'to ice-like patches  = ', fr_ice
WRITE (10, '(A, F7.1)') 'Avg. patch size= ', patch_size
WRITE (10, '(A, F8.2)') 'Number of bulk molecules per ice-like patch = ', n_b
WRITE (10, '(A, F4.2)') 'H-bond formation prob. (bulk)  = ', cnn
WRITE (10, '(A)')' '

WRITE (10, '(A)') 'Mole fractions of different H-bonded species:'
WRITE (10, '(A)') '---------------------------------------------'
WRITE (10, '(A, F5.3)') 'x1 = ', x1
WRITE (10, '(A, F5.3)') 'x2 = ', x2
WRITE (10, '(A, F5.3)') 'x3 = ', x3
WRITE (10, '(A, F5.3)') 'x4 = ', x4
WRITE (10, '(A, F5.3)') 'xu = ', xu
WRITE (10, '(A)') '---------------------------------------------'
WRITE (10, '(A, E11.5)')'ln Z = ', lnZ
WRITE (10, '(A, F8.5)') 'Mu(Ice) (kJ/mol) = ', Mu_Ice
WRITE (10, '(A, F8.5)') 'Mu(Ice), (ST Calculations), (kJ/mol) = ', delta_Mu +
Mu_Liq
WRITE (10, '(A, F8.5)') 'Mu(Ice) - Mu(liq) = ', delta_Mu
WRITE (10, '(A, F10.5)') 'Mu Liq. (ST-calculations),(kJ/mol) = ', mu_Liq
WRITE (10, '(A, F10.5)') 'Mu Bulk (kJ/mol) = ', mu_Blk

ClOSE (10)

END PROGRAM
```

```fortran
!*******************************************************************

DOUBLE PRECISION FUNCTION PartFunc(i)

DOUBLE precision, Parameter :: h = 6.626D-34                    !J.s
DOUBLE precision, Parameter :: k_bz = 1.38068D-23              !J.K-1
DOUBLE precision, Parameter :: R = 8.314472                    !J.K-1.mol-1
DOUBLE precision, Parameter :: pi = 3.1415926535
DOUBLE precision, Parameter :: m_Wat = 2.99236134174693D-26    !kg

INTEGER           :: j

DOUBLE Precision  :: E_H(0:4), nu(0:4,1:6) !J.mol-1, s-1

DATA E_H /11.0352D+3, 8.28432D+3, 5.5229D+03, 2.7614D+03, 0.0/

DATA nu(0,1:6)  /4.35D+12, 5.25D+12, 0.0, 0.0, 0.0, 0.0/
DATA nu(1,1:6)  /1.7988D+12, 4.3470D+12, 4.7967D+12, 4.7967D+12, 4.7967D+12, 5.2464D+12/
DATA nu(2,1:6)  /4.3470D+12, 4.7967D+12, 4.7967D+12, 4.7967D+12, 5.2464D+12, 1.3491D+13/
DATA nu(3,1:6)  /6.2956D+12, 6.2956D+12, 6.2956D+12, 1.4990D+13, 1.9487D+13, 2.3983D+13/
DATA nu(4,1:6)  /6.2956D+12, 6.2956D+12, 6.2956D+12, 1.4990D+13, 1.9487D+13, 2.3983D+13/

DOUBLE precision  :: T, f, I_z, V_f

COMMON /INPUT/ T

I_z = 1.92D-47     !kg.m2
V_f = 4.40D-31     !m3
f = 1.0

IF (i == 0) Then
   DO j =1,2

      f = f/(1.0 - exp(-h * nu(i,j) / (k_bz *T )))

   END DO

      f = f *pi *(2.0*pi*I_z*k_bz*T/h**2.0)**0.5
      f = f *(2.0*pi*m_Wat*k_bz*T/h**2.0)**1.5 * V_f
ElSE

   DO j=1,6

      f = f/(1.0 - exp(-h * nu(i,j)/(k_bz * T)))

   END DO

END IF

PartFunc = f * exp(-E_H(i)/(R*T))

RETURN
END FUNCTION PartFunc
!*******************************************************************
```

Appendix B – ln N vs Vt Diagrams for tri-distilled Water

Experiments performed in trap A
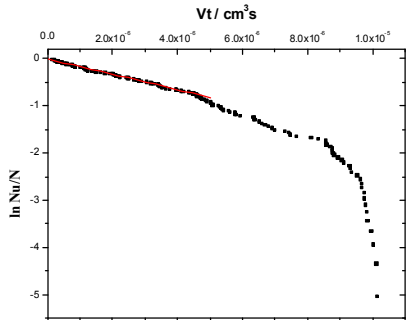
T-meas.: -35.66 °C, J = 1.62 E5
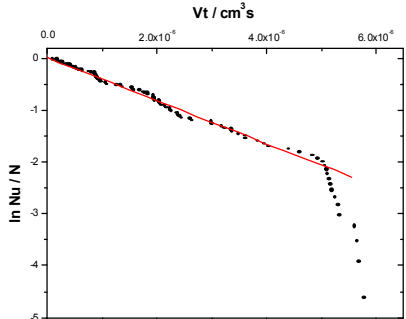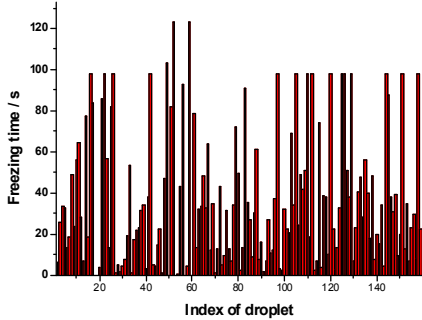
T-meas.: -35.67 °C, J = 4.16 E5
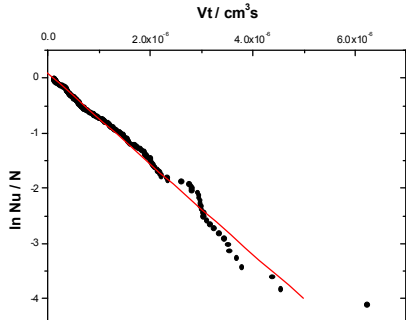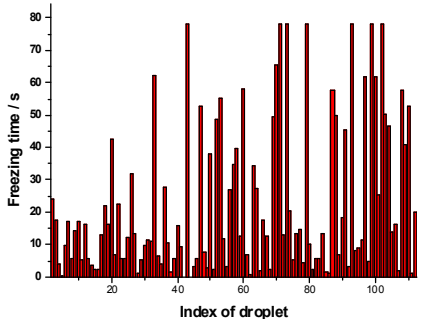
T-meas.: -35.77 °C, J = 8.19 E5
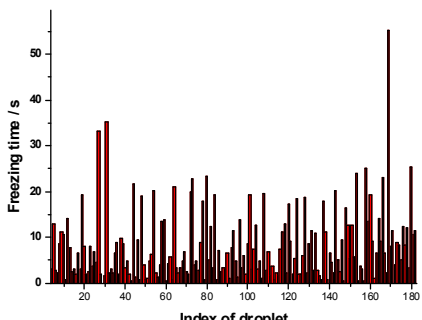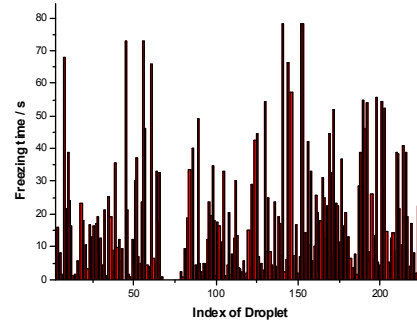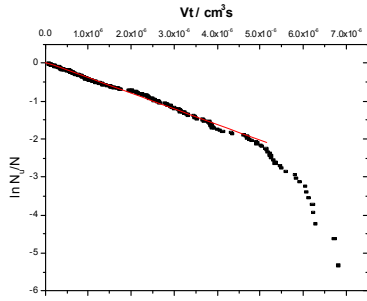
T-meas.: -35.82 °C, J = 4.12 E5
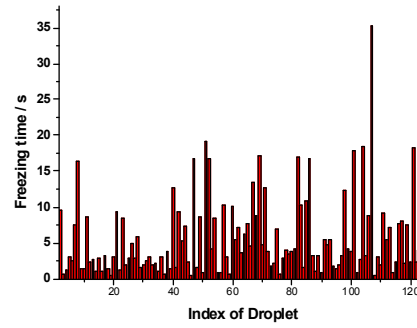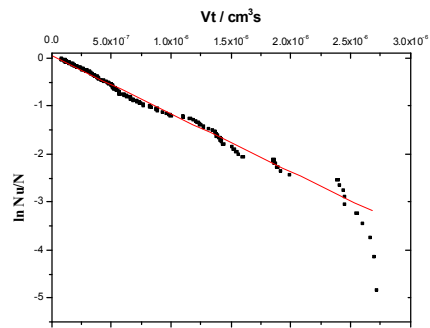
T-meas.: -35.89 °C, J = 1.21 E6
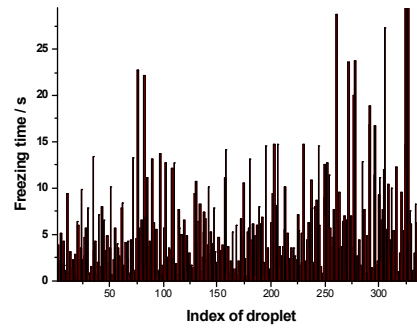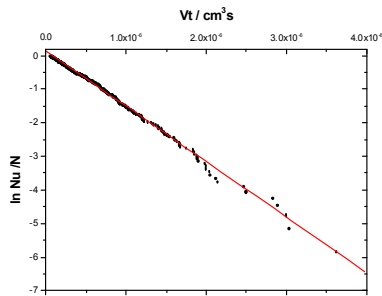
T-meas.: -36.03 °C, J = 1.65 E6
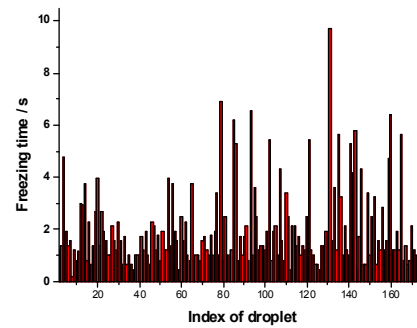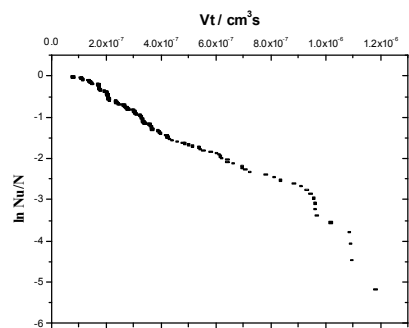
T-meas.: -36.10 °C, J = N.A.
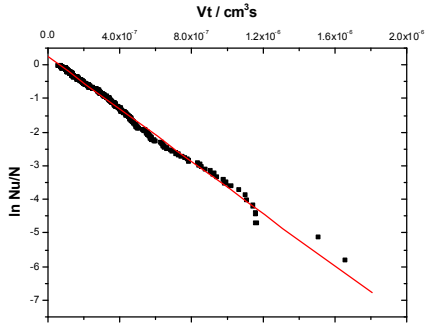
T-meas.: -36.16 °C, J = 3.89 E6
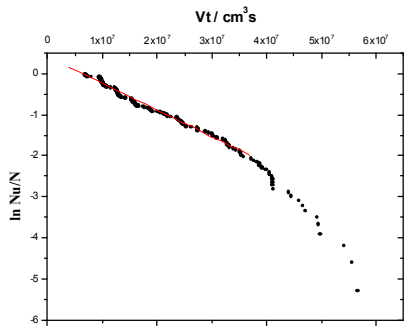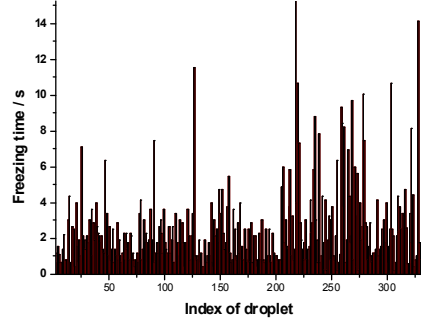
T-meas.: -36.28 °C, J = 6.52 E6
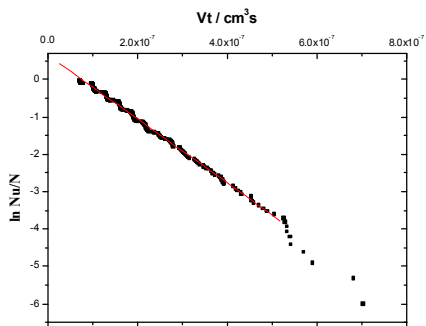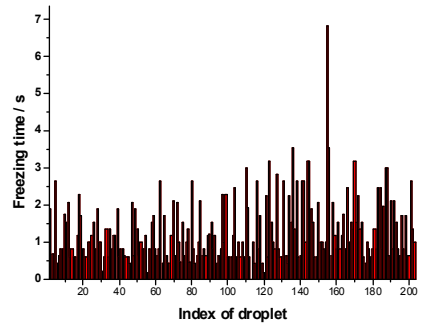
T-meas.: -36.38 °C, J = 8.7 E6
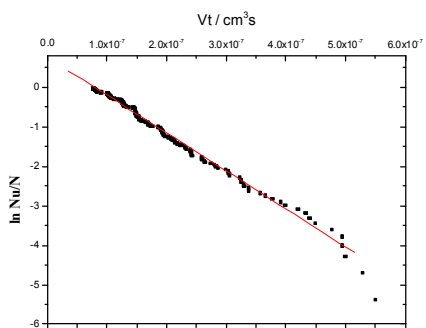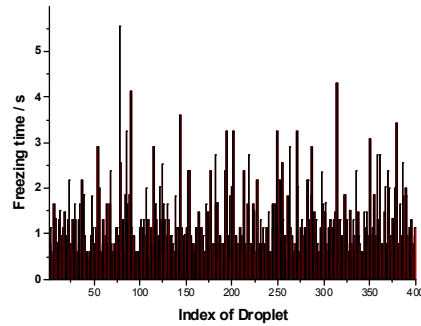
T-meas.: -36.60 °C, J = 9.60 E6

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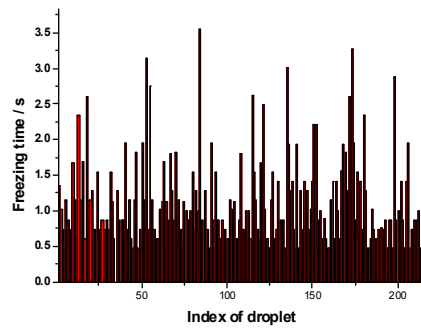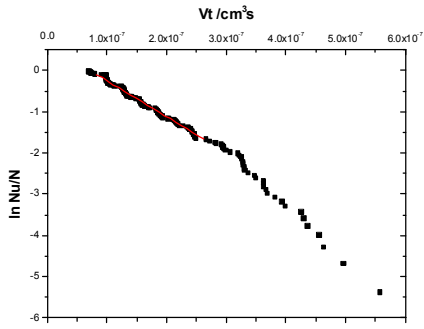
T-meas.: -36.66 °C, J = 8.60 E6
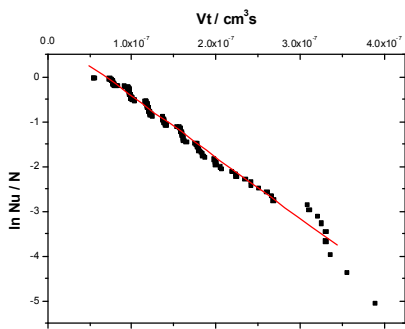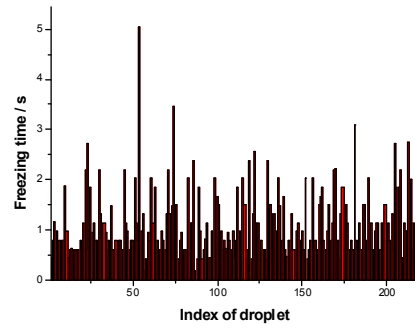
T-meas.: -36.76 °C, J = 1.37 E7
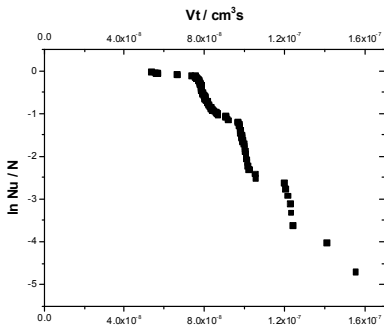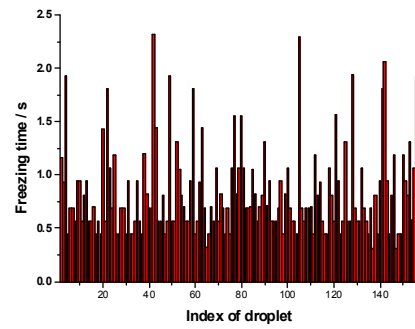
T-meas.: -37.16 °C, J = N.A.
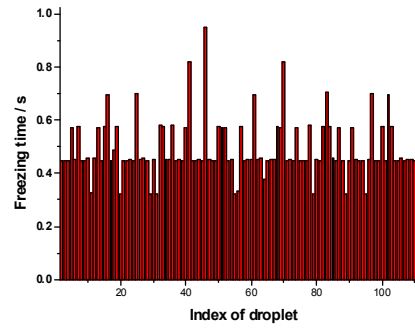
Appendix C – ln N vs Vt Diagrams For Aqueous Mixtures at Low Solute Concentrations

Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.002
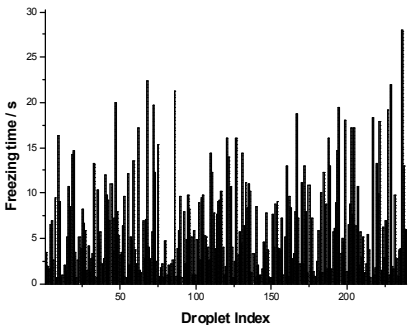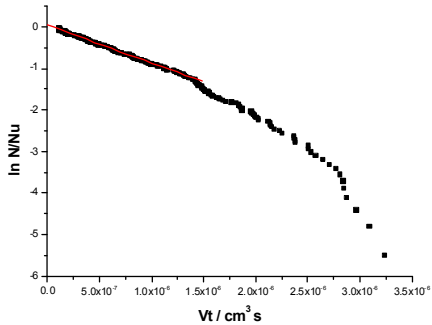
T-meas.: -36.26 °C, J = 9.12E5
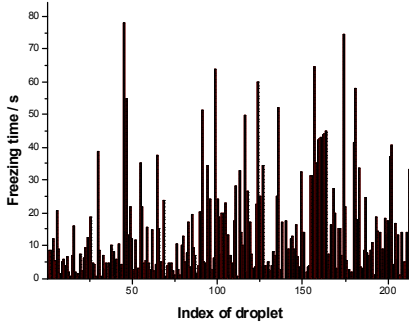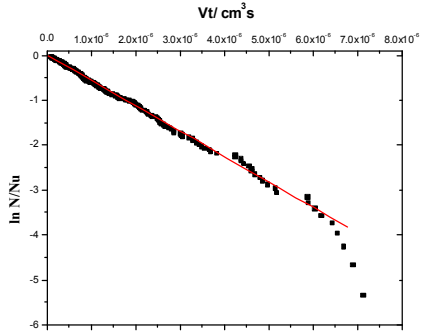
T-meas.: -36.32 °C, J = 5.66E5
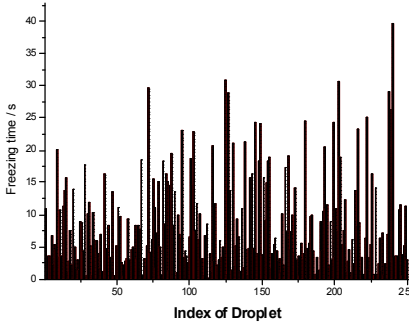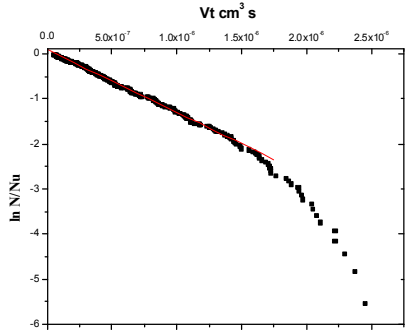
T-meas.: -36.40 °C, J = 1.39E6
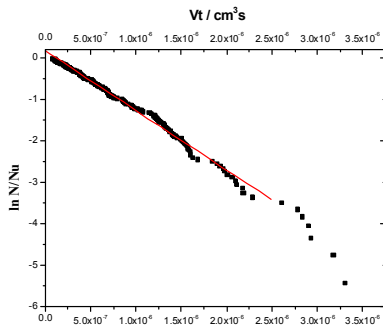
T-meas.: -36.50 °C, J = 1.45E6
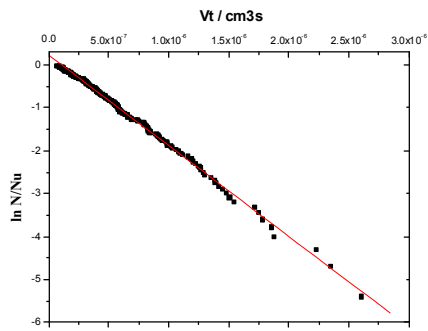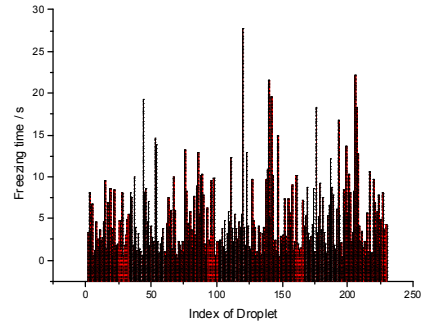
T-meas.: -36.55 °C, J = 2.11E6
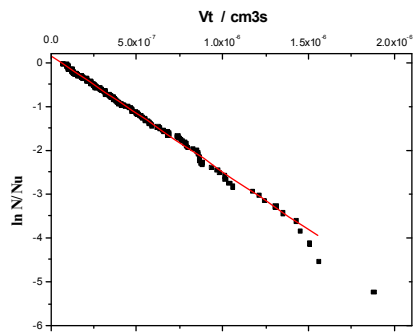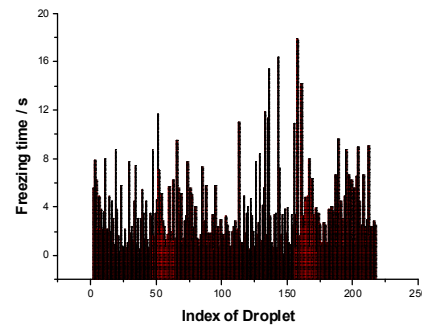
T-meas.: -36.59 °C, J = 2.65E6
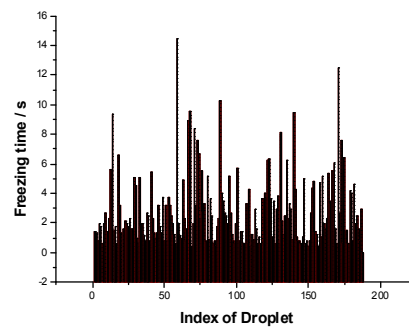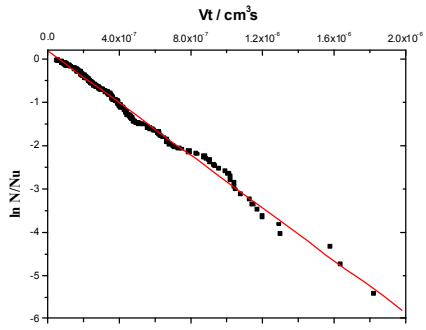
T-meas.: -36.76 °C, J = 3.03E6
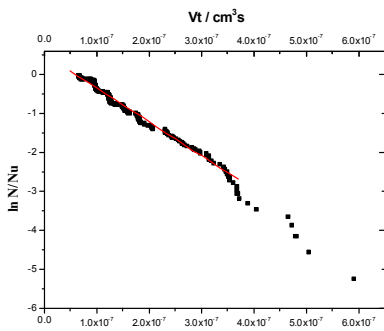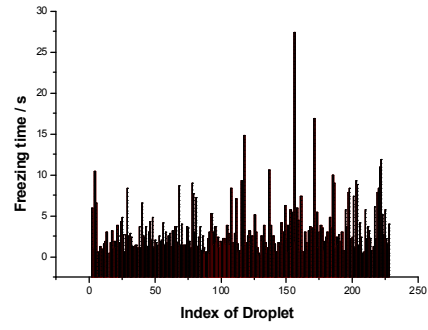
T-meas.: -36.83 °C, J = 8.70E6
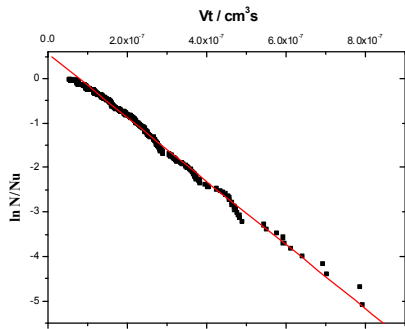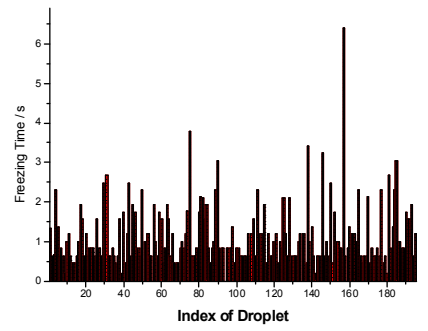
T-meas.: -36.85 °C, J = 7.18E6
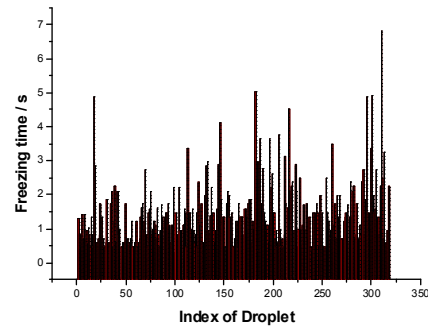
Water + Ethanol Binary Liquid Mixture – x_{eth} = 0.002
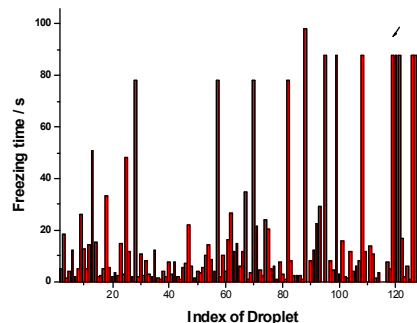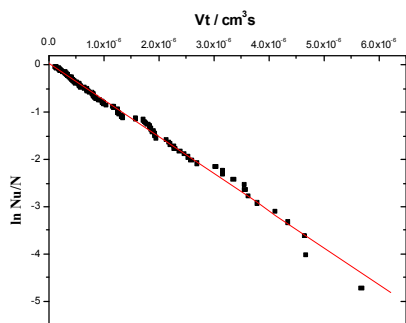
T-meas: -36.03 °C, J = 7.82 E6 (Trap A)
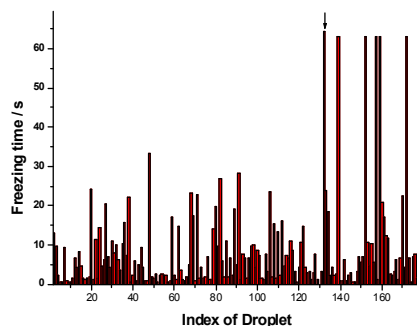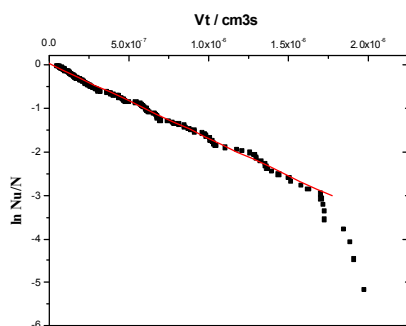
T-meas: -36.13 °C, J = 1.71 E6 (Trap A)
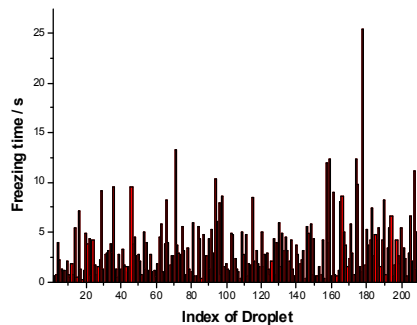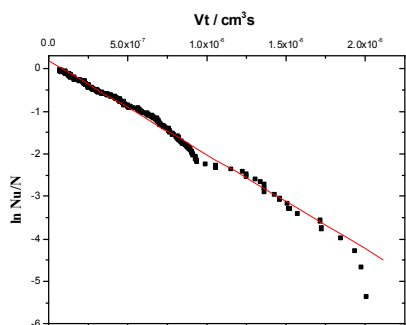
T-meas: -36.23 °C, J = 2.21 E6 (Trap A)
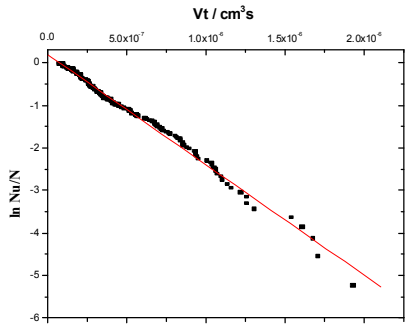
T-meas: -36.28 °C, J = 2.60 E6 (Trap A)
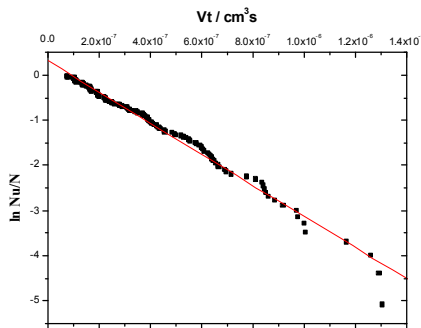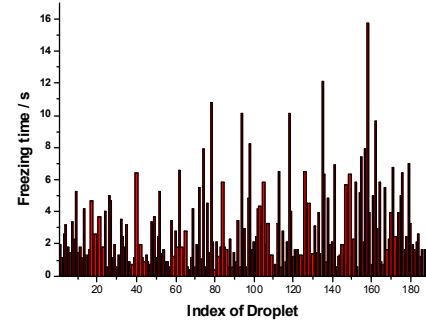
T-meas: -36.36 °C, J = 3.4 E6 (Trap A)
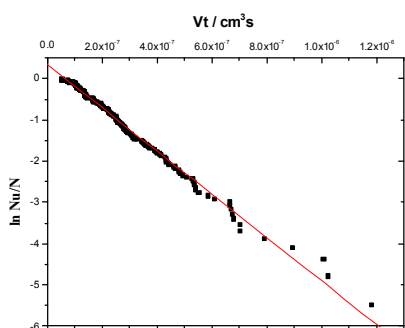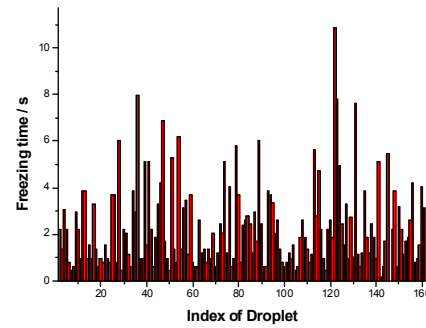
T-meas: -36.43 °C, J = 5.24 E6 (Trap A)
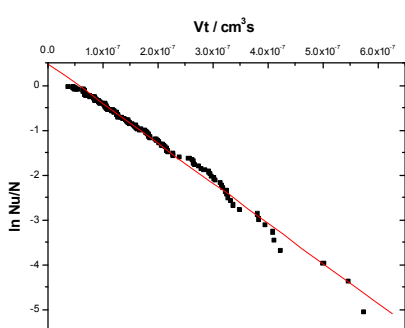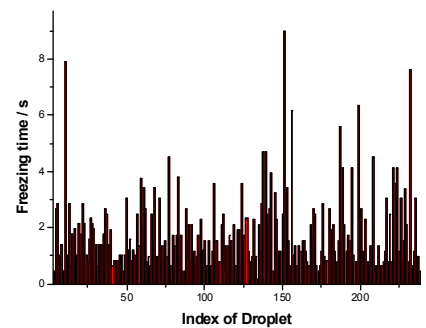
T-meas: -36.49 °C, J = 8.93 E6 (Trap A)
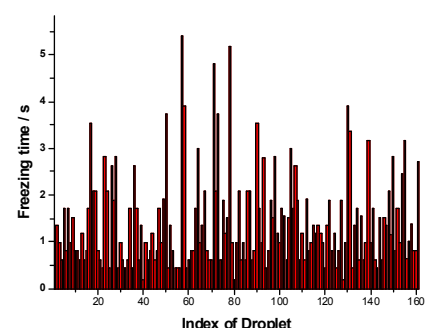
Water + Isopropanol Binary Liquid Mixture – $x_{isoprop}$ = 0.002
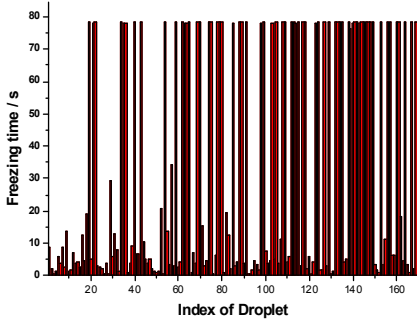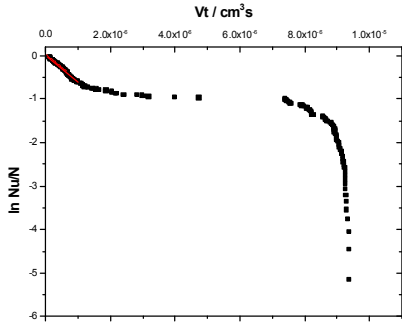
T-meas: -36.04 °C, J = 6.12 E5 (Trap A)
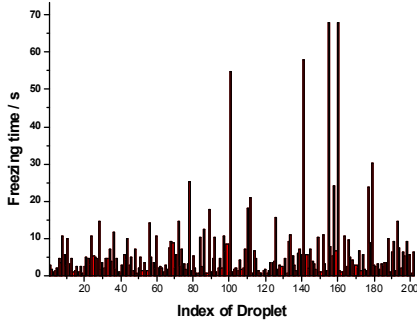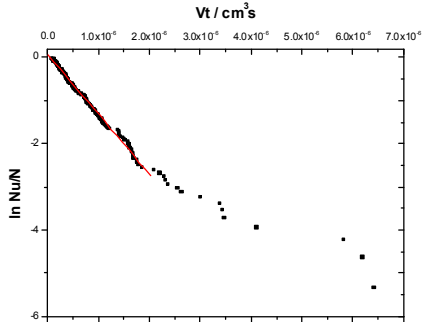
T-meas: -36.09 °C, J = 1.38 E6 (Trap A)
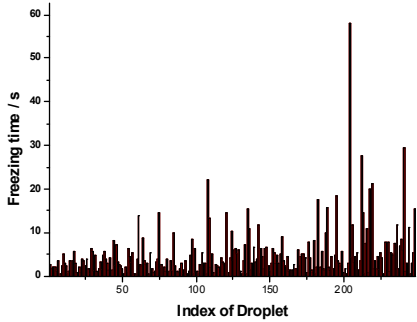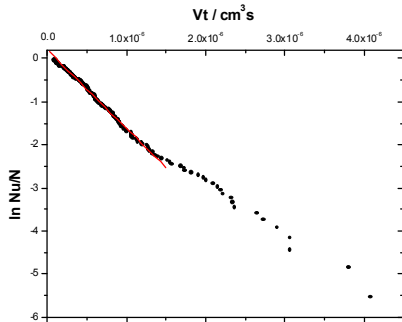
T-meas: -36.14 °C, J = 1.82 E6 (Trap A)
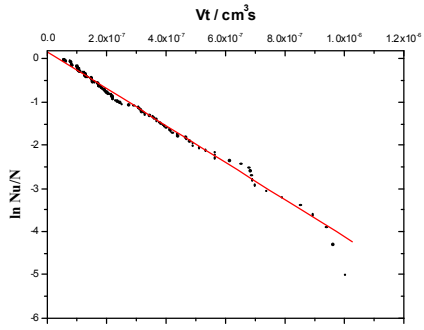
T-meas: -36.24 °C, J = 4.30 E6 (Trap A)
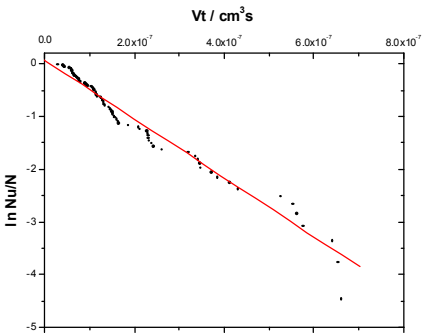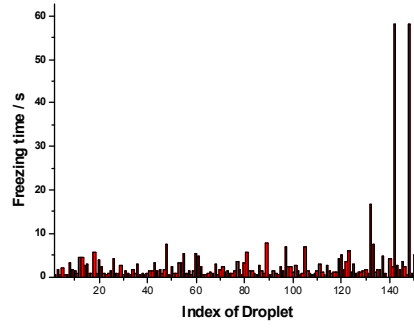
T-meas: -36.34 °C, J = 5.57 E6 (Trap A)
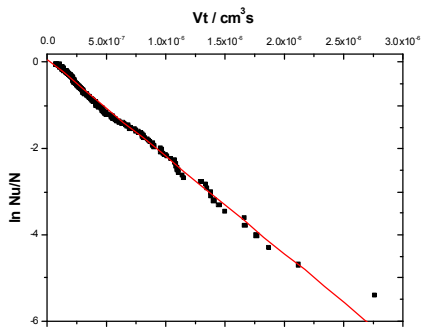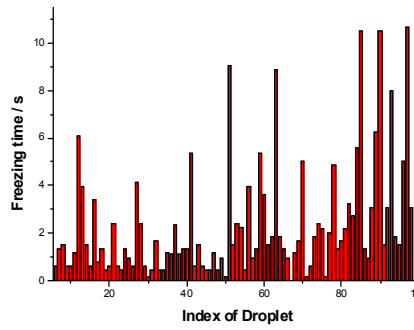
T-meas: -36.38 °C, J = 2.25 E6 (Trap A)

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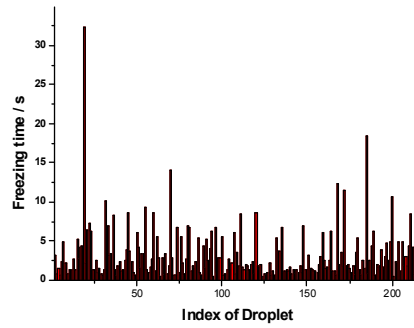
Water + Glycol Binary Liquid Mixture – x_{gly} = 0.002
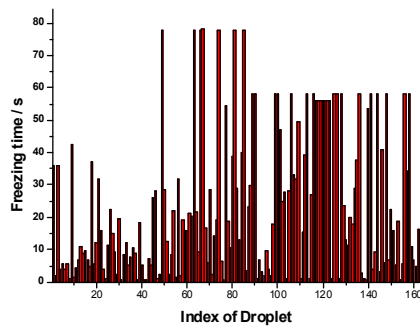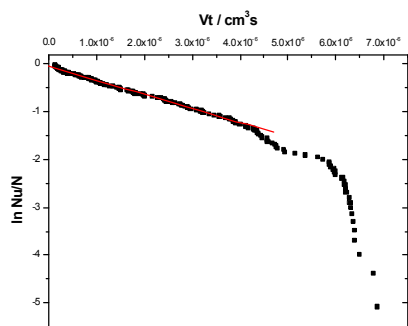
T-meas: -36.16 °C, JL = 2.95 E5 (Trap A)
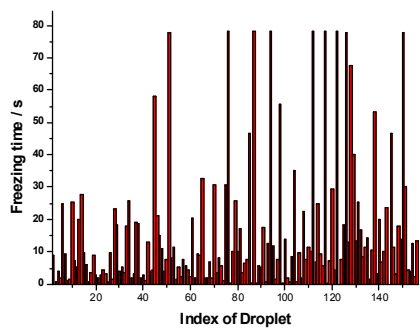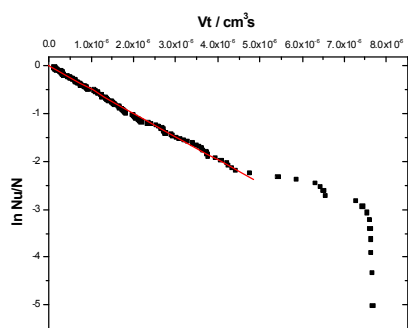
T-meas: -36.22 °C, JL = 4.92 E5 (Trap A)
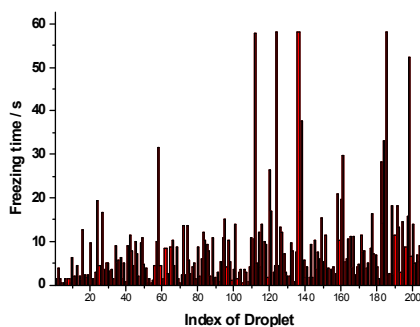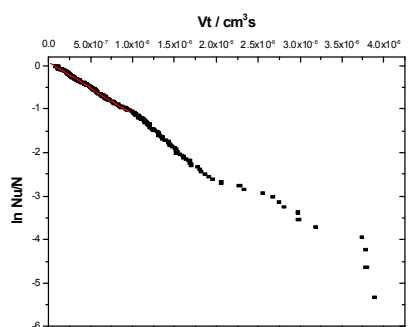
T-meas: -36.36 °C, JL = 1.21 E6 (Trap A)
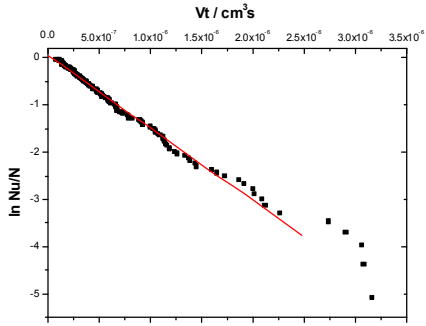
T-meas: -36.43 °C, JL = 1.54 E6 (Trap A)
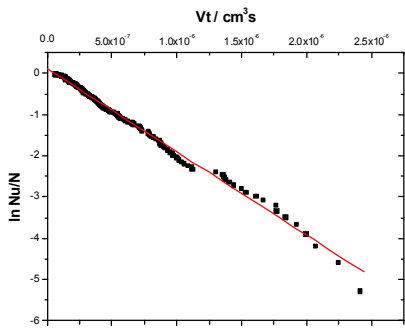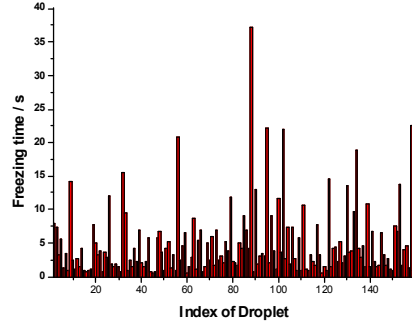
T-meas: -36.51 °C, JL = 2.02 E6 (Trap A)
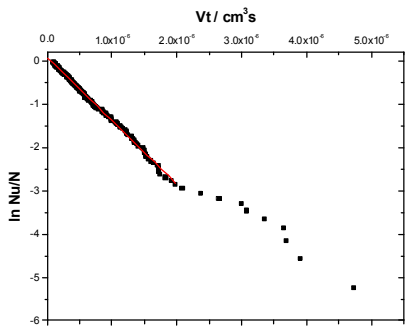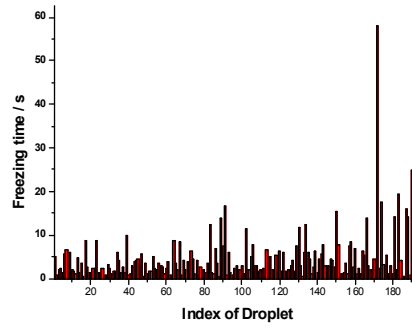
T-meas: -36.57 °C, J_L = 1.47 E6 (Trap A)
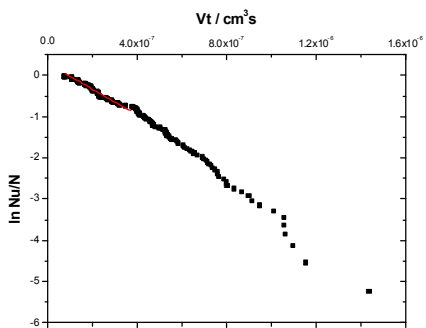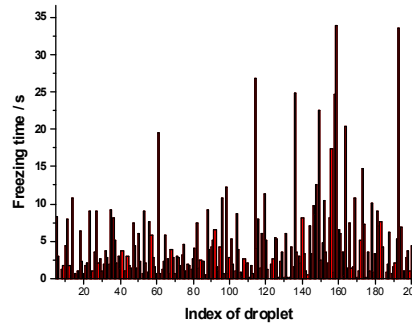
T-meas: -36.65 °C, J_L = 3.12 E6 (Trap A)

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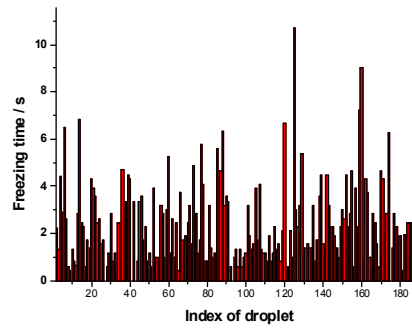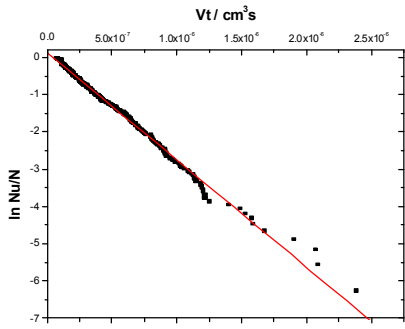
T-meas: -36.71 °C, JL = 2.88 E6 (Trap A)
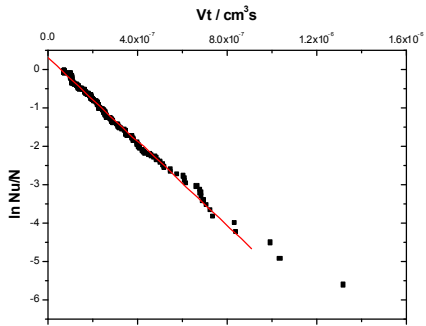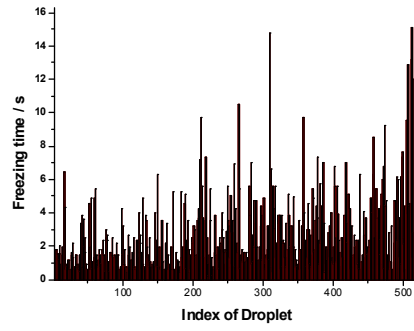
T-meas: -36.74 °C, J_L = 5.45 E6 (Trap A)
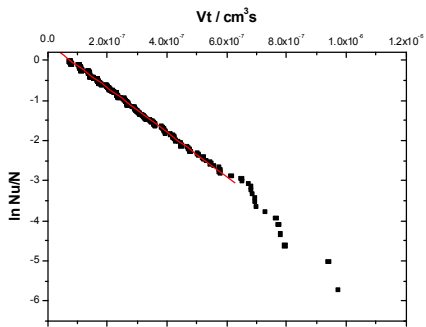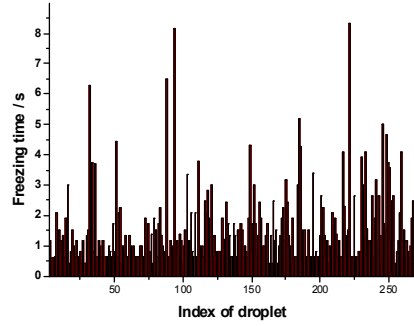
T-meas: -36.81 °C, JL = 5.54 E6 (Trap A)
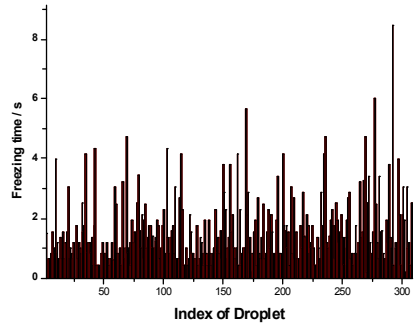
Aqueous Urea Solution – x_{urea} = 0.002
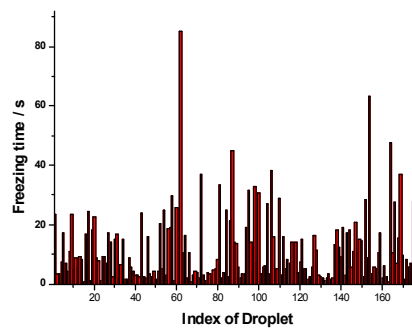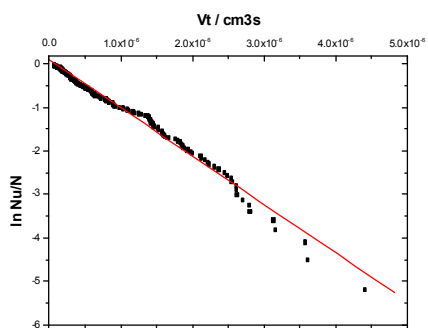
T-meas: -35.96 °C, J = 1.11 E6 (Trap B)
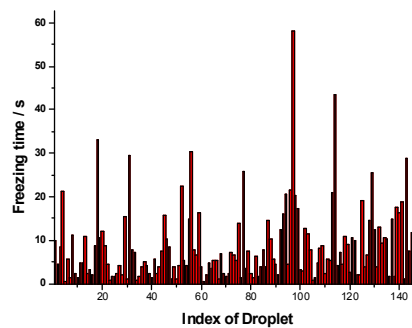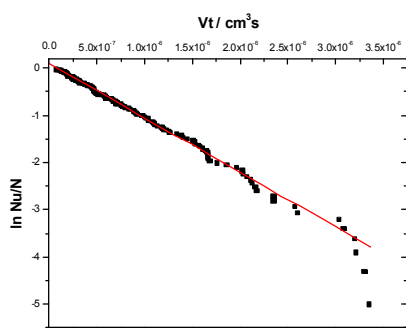
T-meas: -36.01 °C, J = 1.15 E6 (Trap B)
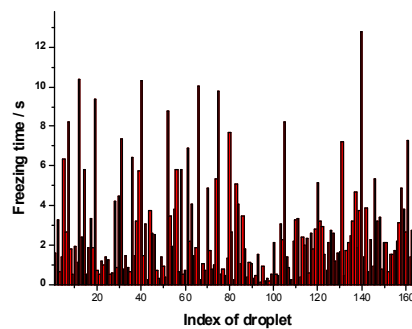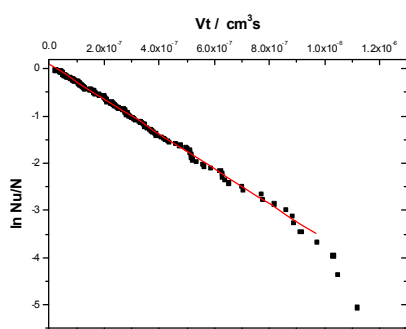
T-meas: -36.13 °C, J = 3.71 E6 (Trap B)
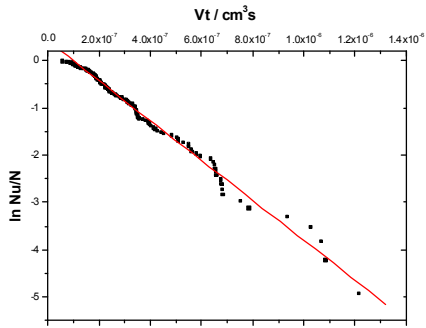
T-meas: -36.17 °C, J = 4.2 E6 (Trap B)
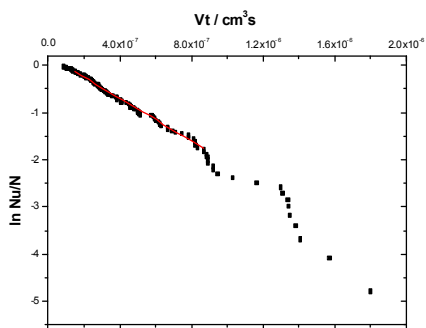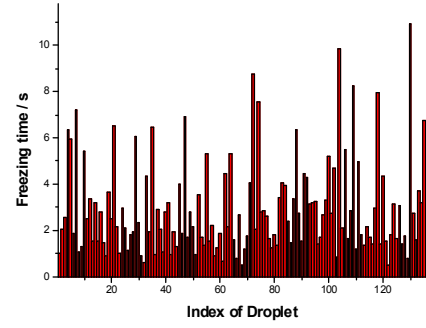
T-meas: -36.18 °C, JR = 2.25 E6 (Trap B)
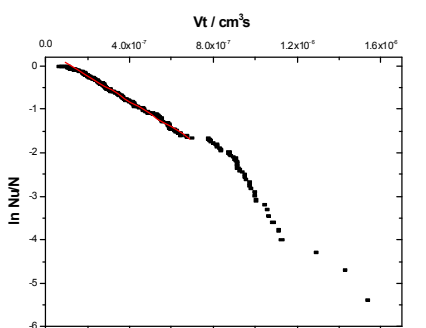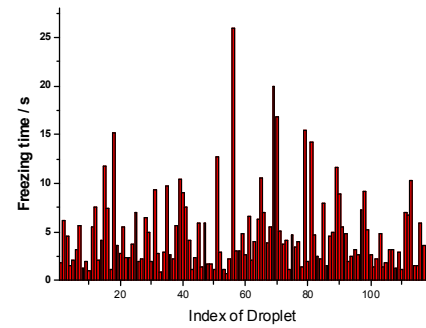
T-meas: -36.28 °C, JL = 2.93 E6 (Trap B)
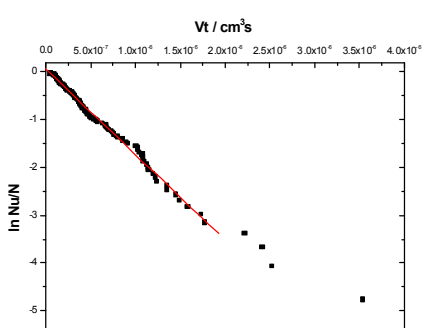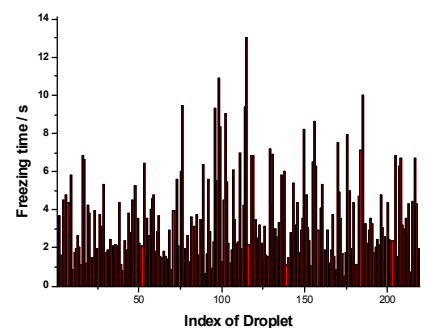
T-meas: -36.33 °C, JL = 1.79 E6 (Trap B)
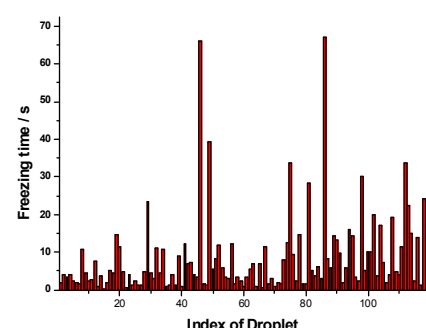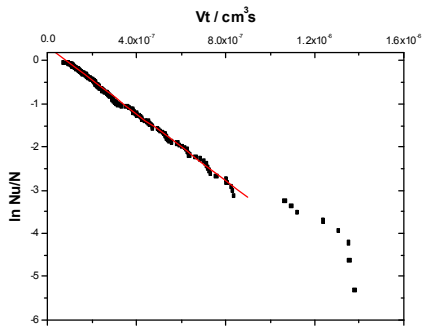
T-meas: -36.34 °C, JR = 3.88 E6 (Trap B)
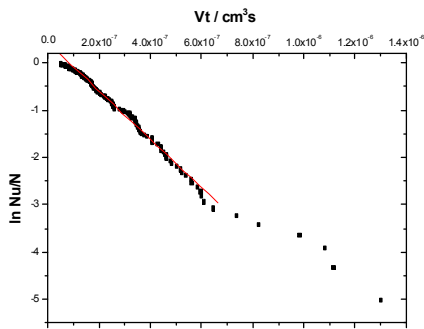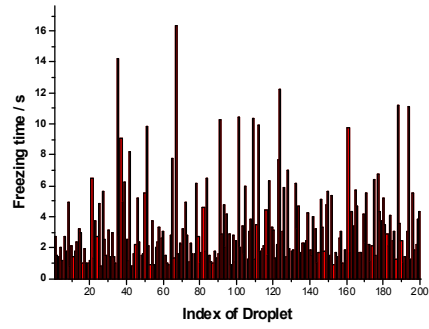
T-meas: -36.38 °C, JR = 5.09 E6 (Trap B)
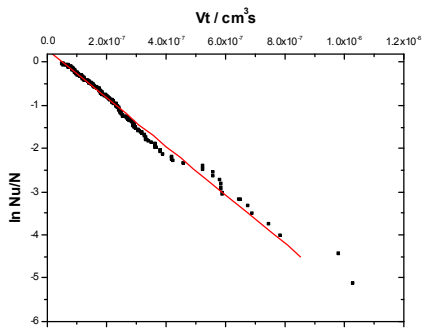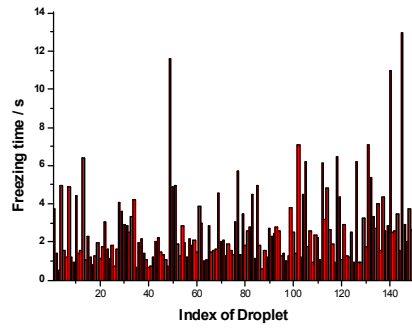
T-meas: -36.47 °C, JL = 5.61 E6 (Trap B)
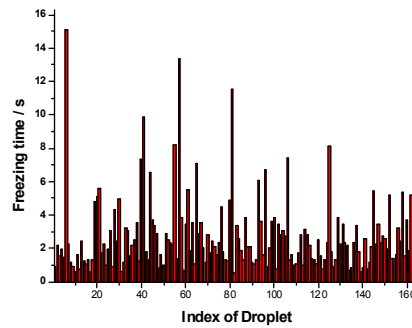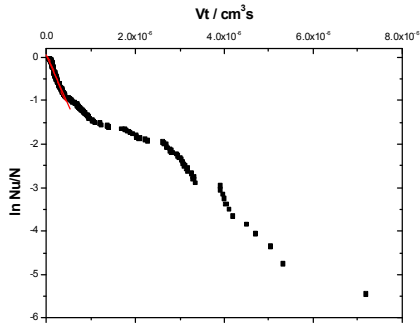
T-meas: -36.51 °C, JL = 2.62 E6 (Trap B)
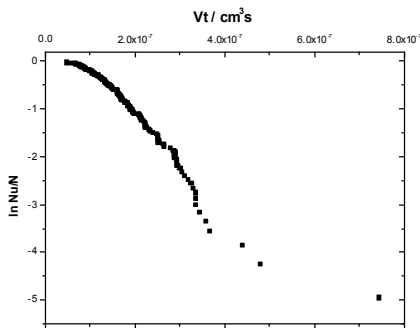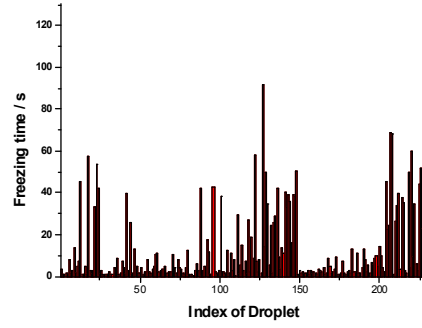
T-meas: -36.52 °C (Trap B)
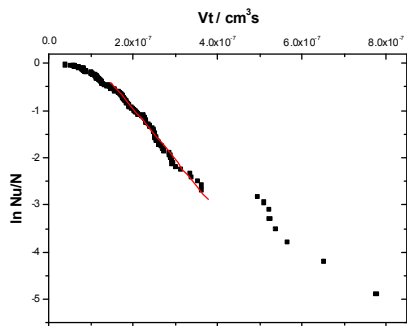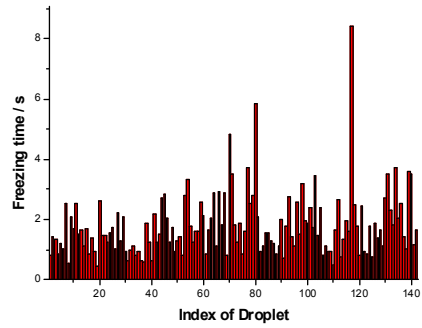
T-meas: -36.54 °C, JR = 1.07 E7 (Trap B)
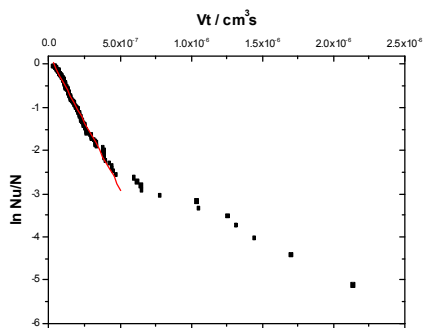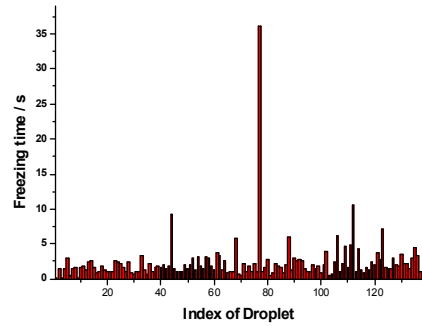
T-meas: -36.58 °C, JL = 6.19 E6 (Trap B)
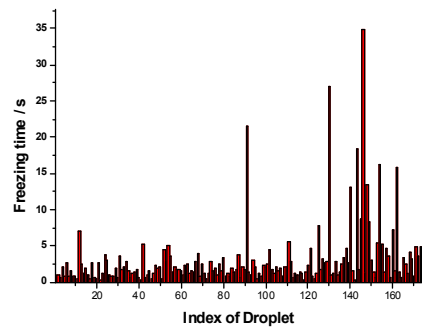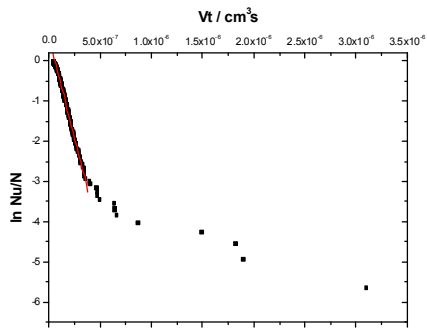
T-meas: -36.68 °C, JL = 1.00 E7 (Trap B)
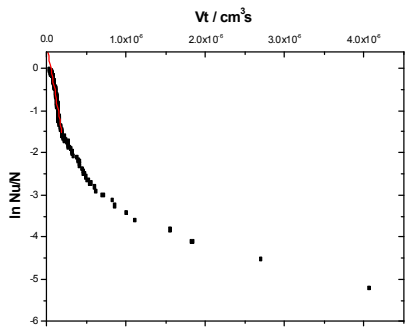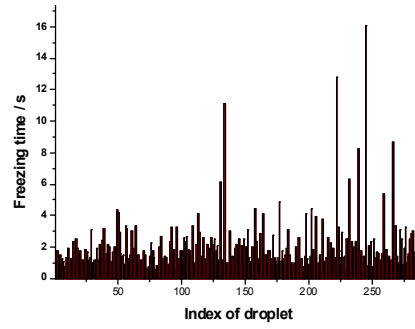
T-meas: -36.81 °C, JL = 1.08 E7 (Trap B)
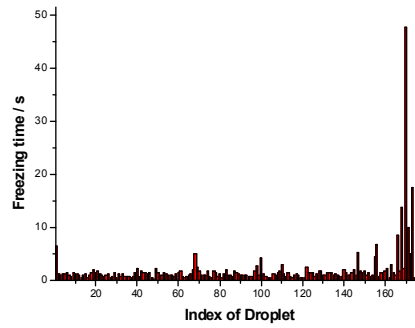
Aqueous Urea Solution – x_{urea} = 0.01
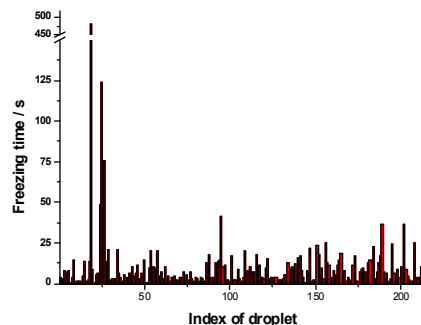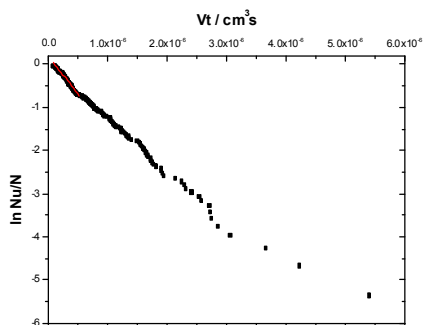
T-meas: -38.29 °C, JL = 1.75 E6 (Trap B)
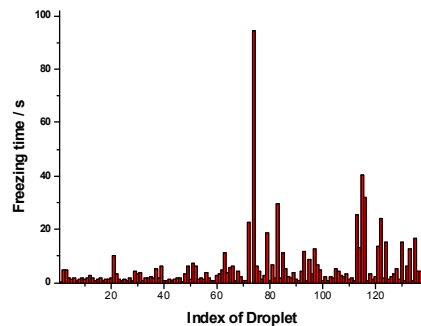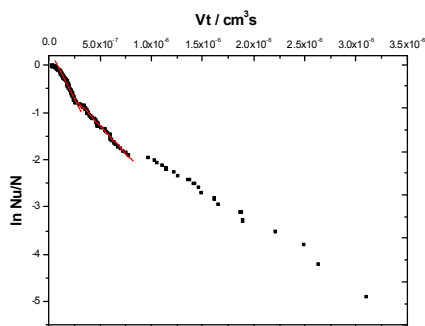
T-meas: -38.39 °C, JL = 4.16 E6, JR = 2.34 E6 (Trap B)
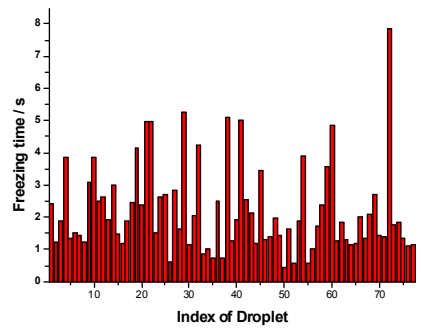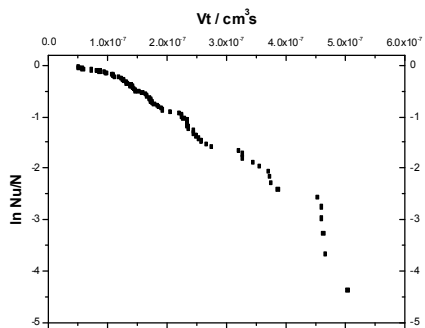
T-meas: -38.55 °C, JL = N.A. (Trap B)

Aqueous Urea Solution – x_{urea} = 0.02
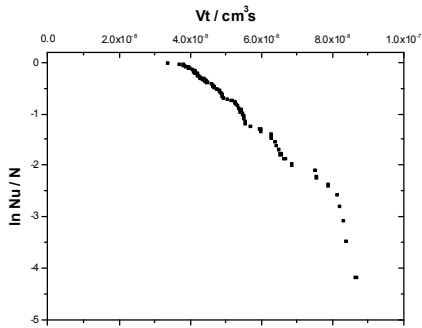
T-meas: -41.93 °C, J = N.A. (Trap B)
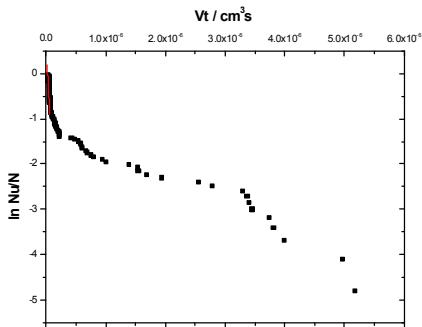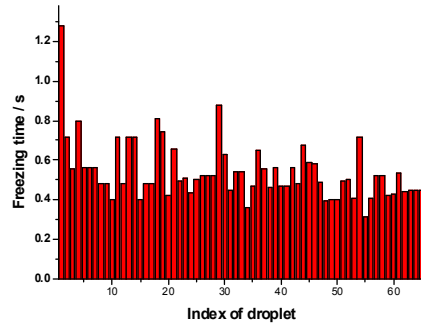
T-meas: -43.04 °C, J_L = 2.21 E7 (Trap B)
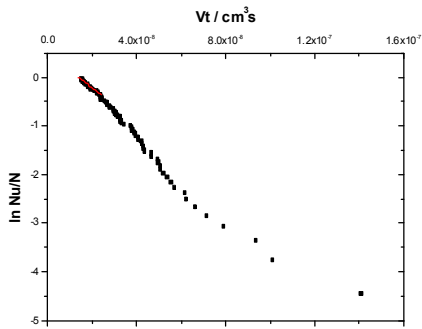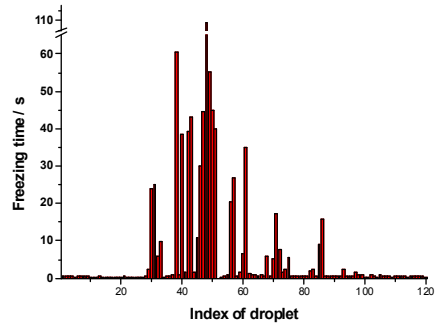
T-meas: -43.20 °C, J_L = 3.55 E7 (Trap B)
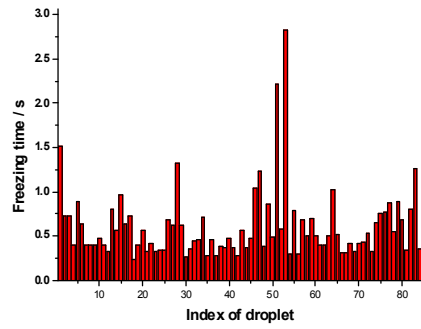
Appendix D – ln N vs. V·t Diagrams for Water + 1, 4-dioxane Liquid Mixtures

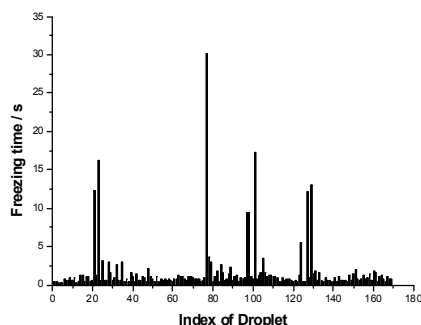## Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.04
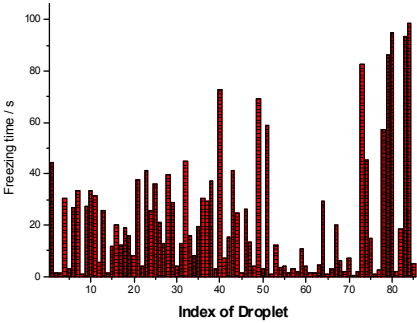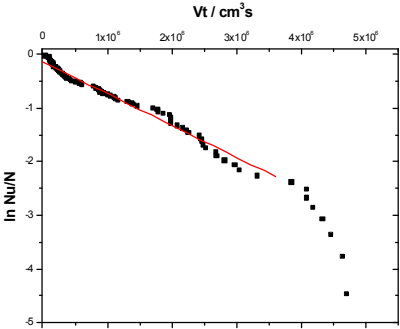
T-meas: -43.3 °C, J=5.95E5 (Trap B)
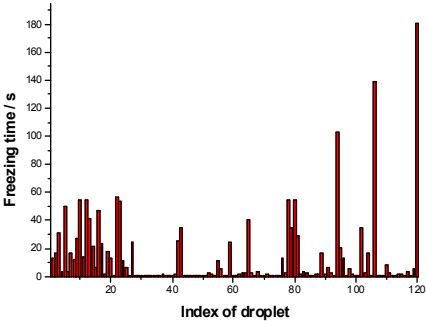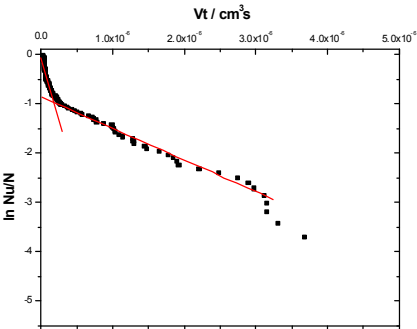
T-meas: -43.6 °C, JL=5.95E5, JR=6.43E5 (Trap B)
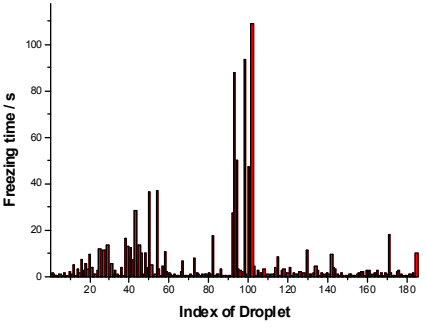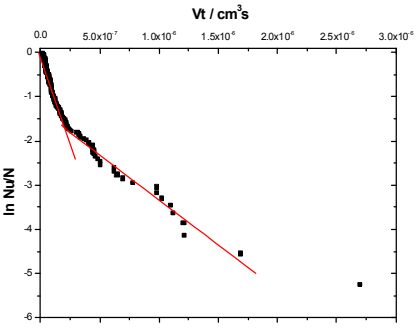
T-meas: -43.7 °C, JL=8.06E6, JR=2.03E6 (Trap B)
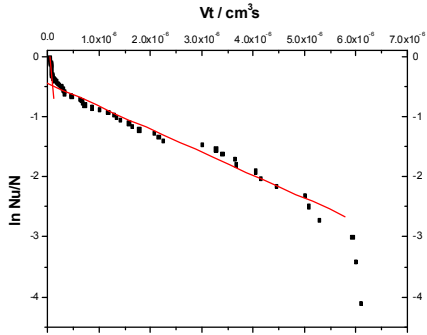
T-meas: -43.95 °C, JL=7.04E6, JR=3.80E5 (Trap B)
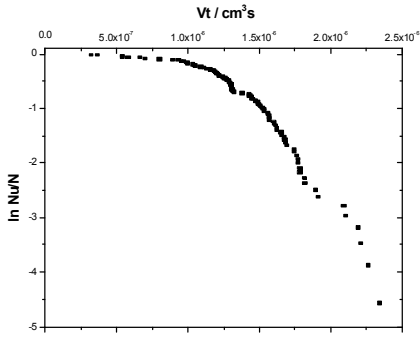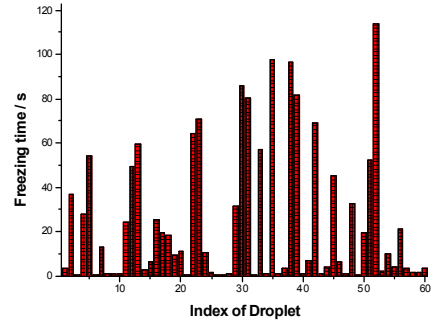
T-meas: -43.19 °C, J1=   , JR=   (Trap A)
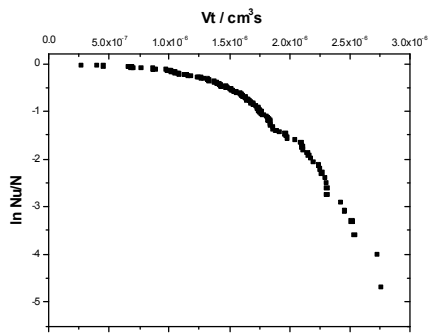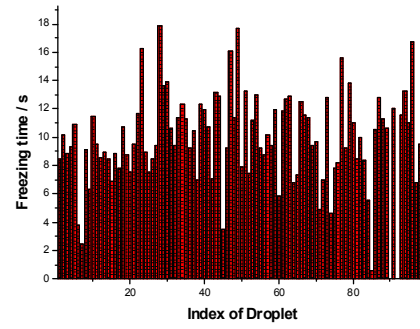
T-meas: -43.29 °C, J1=   , JR=   (Trap A)
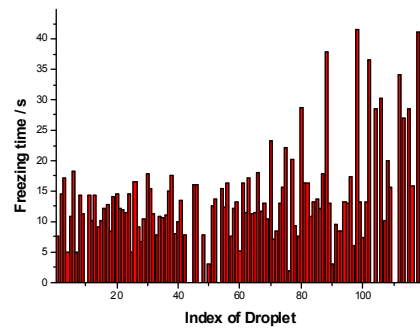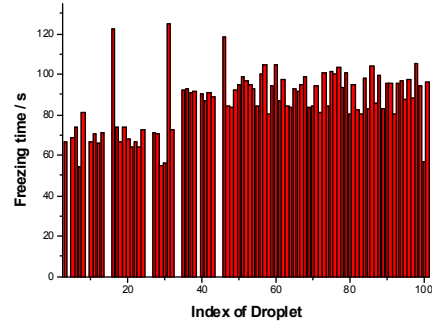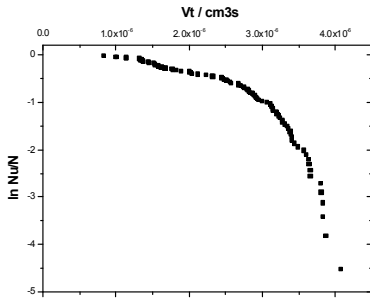
T-meas: -43.31 °C, J1=   , JR=   (Trap A)
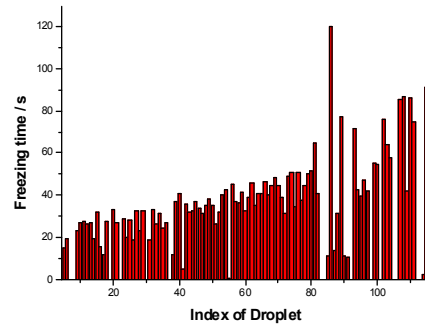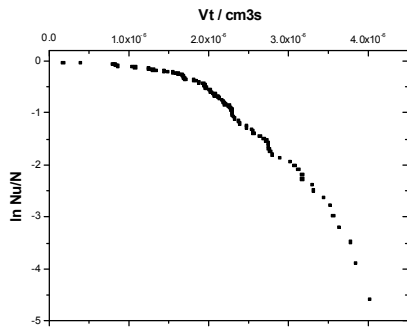
T-meas: -43.43 °C, J1=   , JR=   (Trap A)
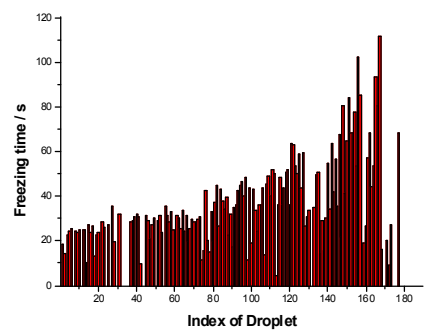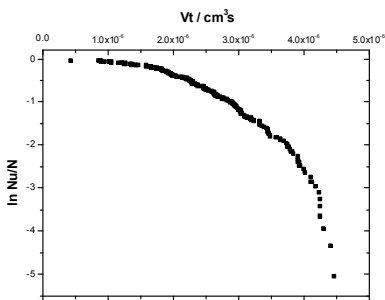
T-meas: -43.62 °C, JL=   , JR=   (Trap A)
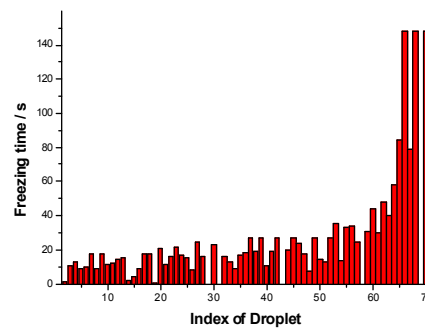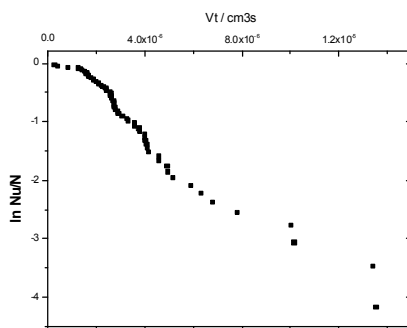
T-meas: -44.36 °C, JL=   , JR=   (Trap A)
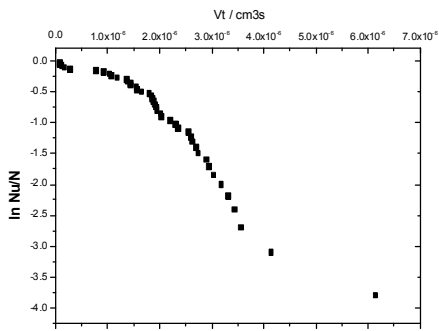
T-meas: -44.67 °C, JL=   , JR=   (Trap A)
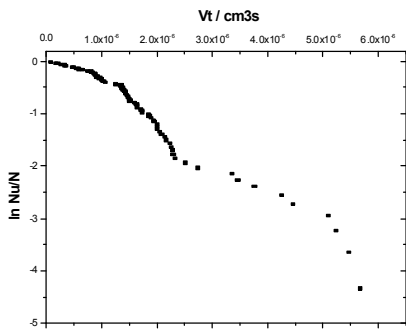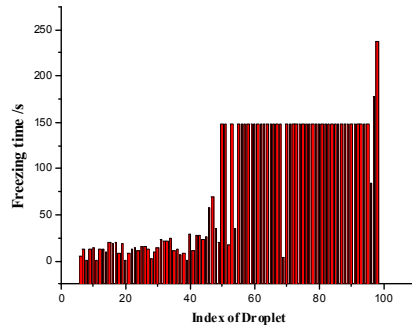
T-meas: -44.99 °C, JL=   , JR=   (Trap A)
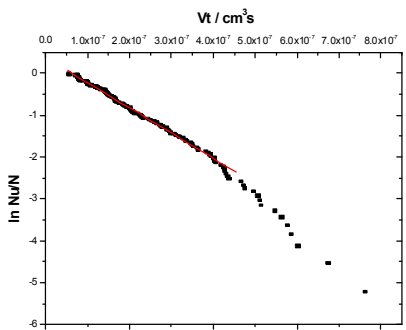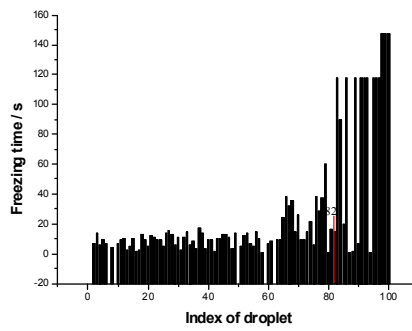
T-meas: -45.17 °C, J=6.02E6 (Trap A)
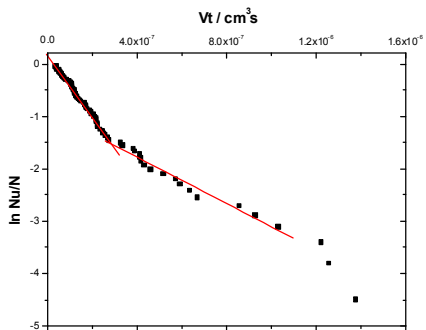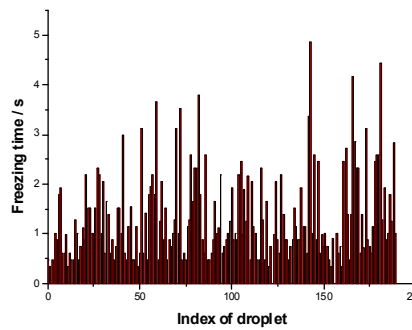
T-meas: -47.54 °C, JL=5.86E6, JR=2.21E6 (Trap A)
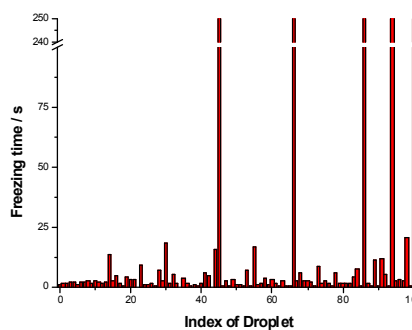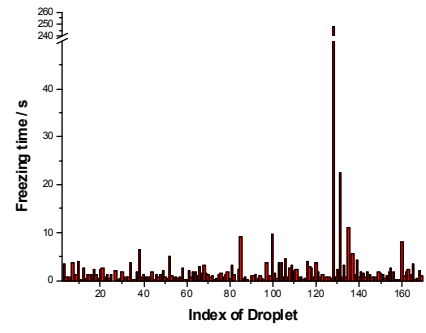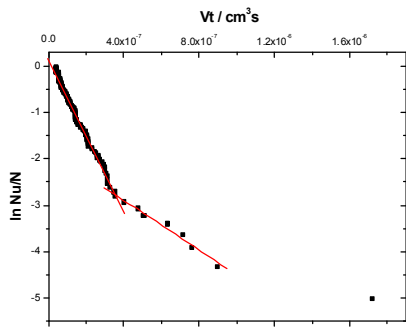
T-meas: -47.64 °C, JL=8.51E6, JR=2.68E6 (Trap A)

Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.133
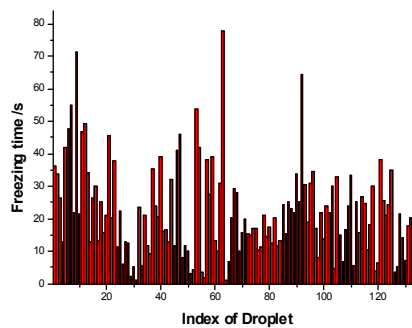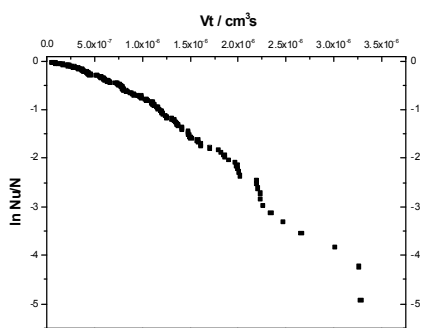
T-meas: -54.85 °C, JL=   , JR=   (Trap B)
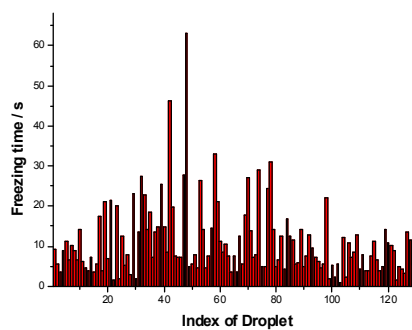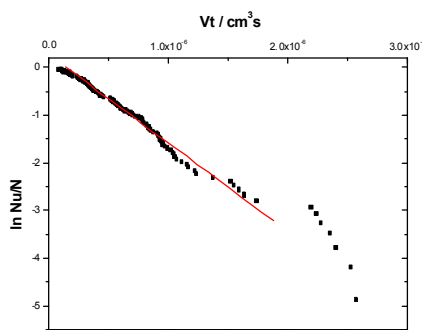
T-meas: -54.98 °C, JL=   , JR=1.85 E6 (Trap B)
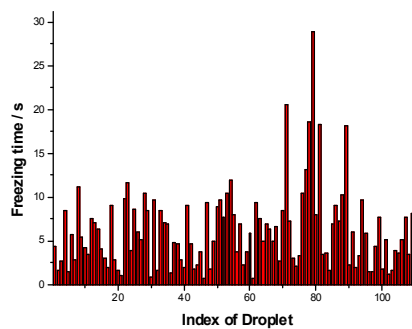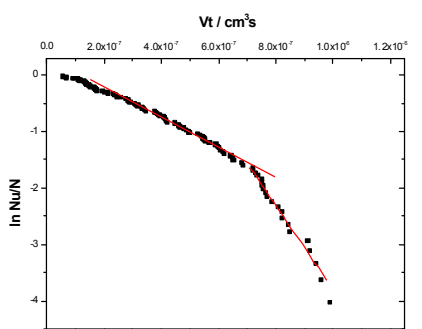
T-meas: -54.07 °C, JL= 2.71 E6, JR=7.42 E6 (Trap B)
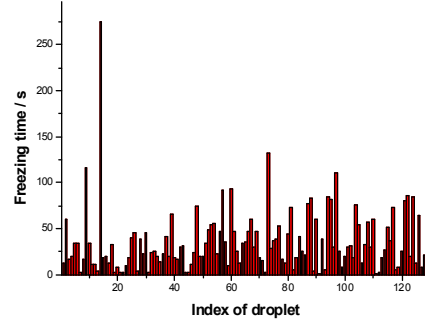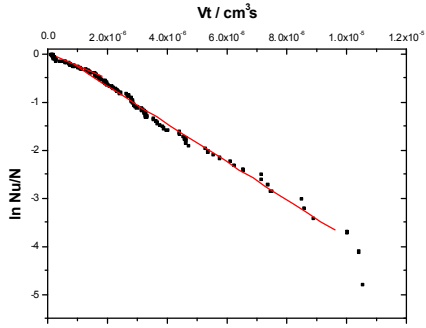
T-meas: -54.34 °C, JL= 2.37 E5, JR=3.94 E5 (Trap B)
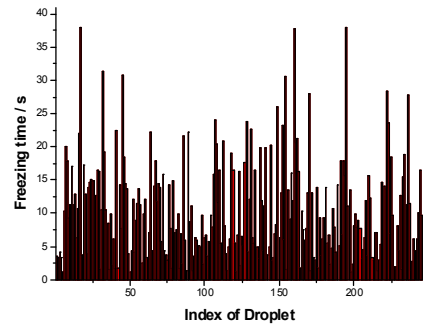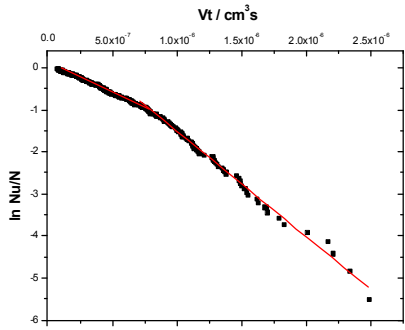
T-meas: -54.46 °C, JL= 1.40 E6, JR=2.51 E6 (Trap B)
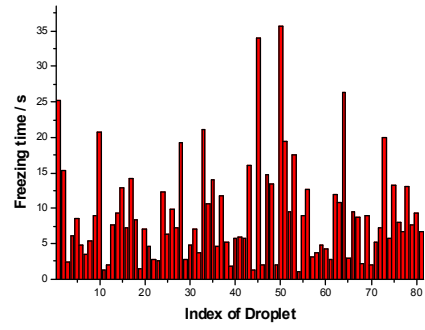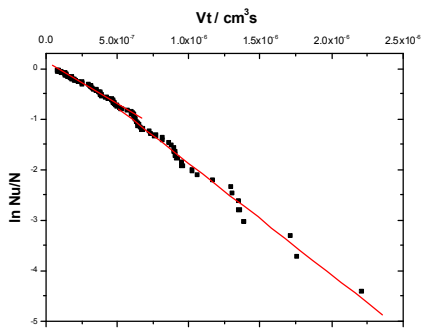
T-meas: -54.55 °C, JL= 1.67 E6, JR=2.20 E6 (Trap B)
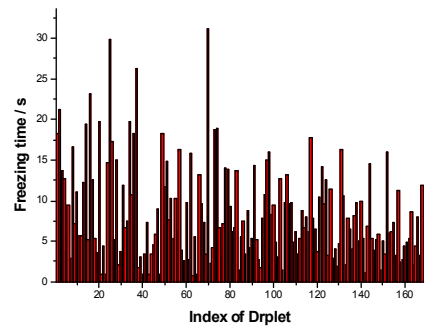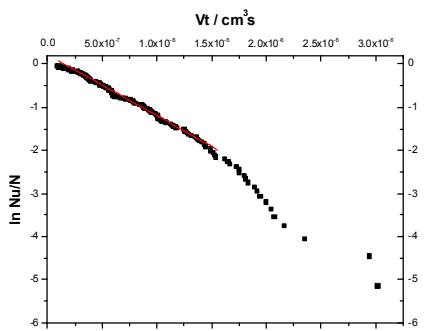
T-meas: -54.65 °C, JL=   , JR=1.42 E6 (Trap B)
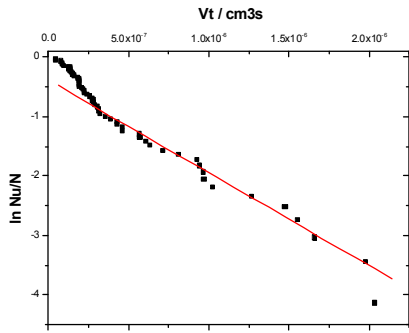
T-meas: -55.10 °C, JL=   , JR= 1.56 E6 (Trap B)
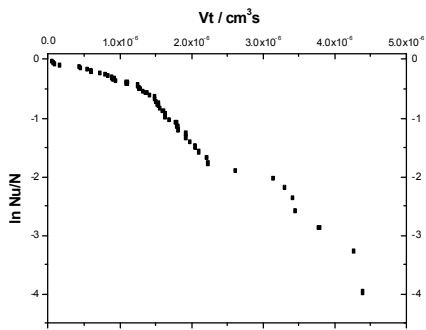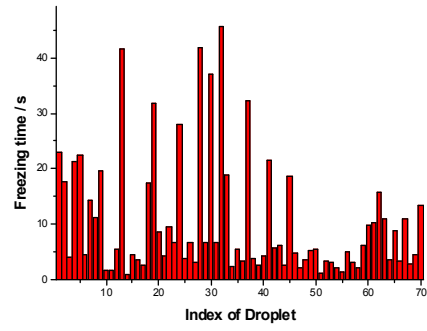
T-meas: -55.12 °C, JL=   , JR=   (Trap B)
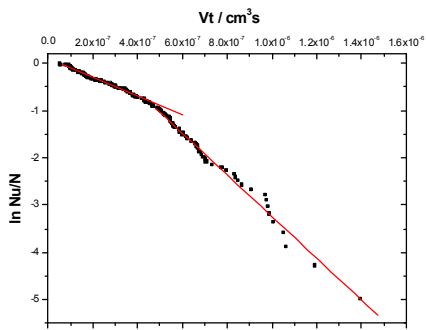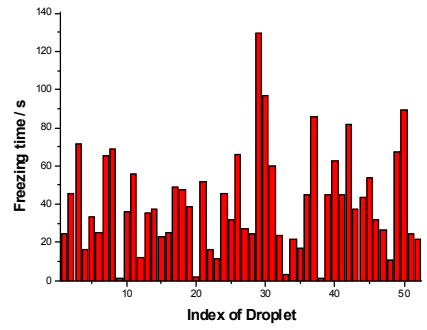
T-meas: -55.18 °C, JL= 2 E6, JR=4.40 E6 (Trap B)
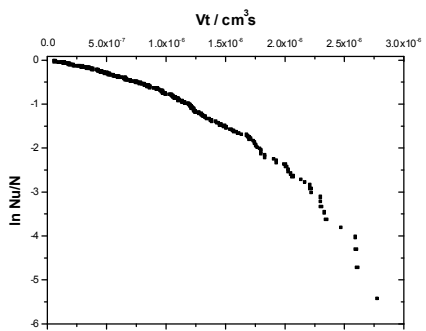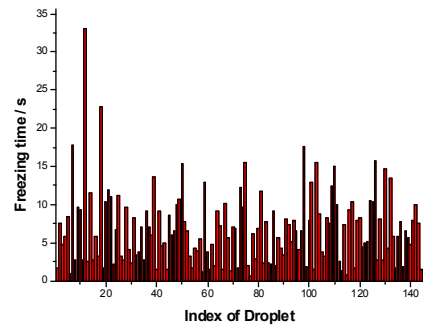
T-meas: -55.23 °C, JL=   , JR=   (Trap B)
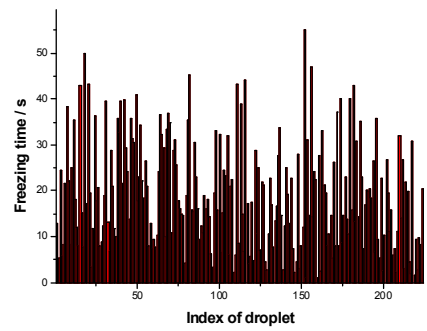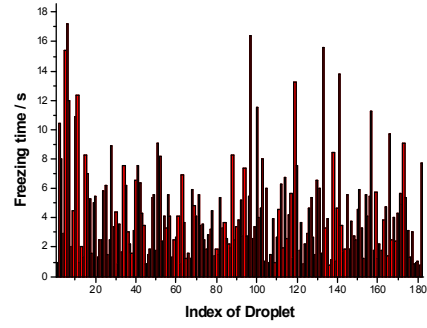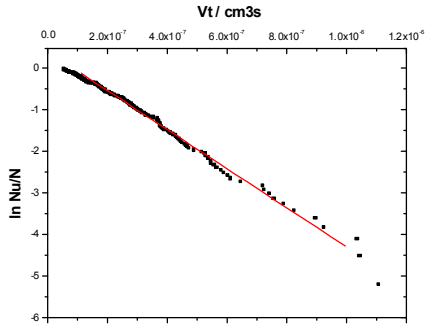
T-meas: -55.28 °C, JL=   , JR=4.73 E6 (Trap B)
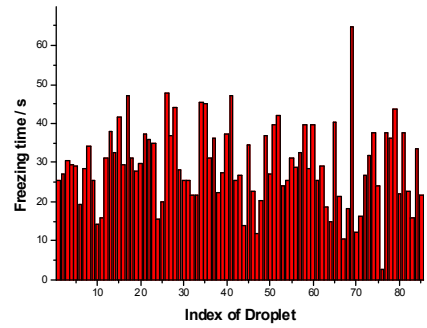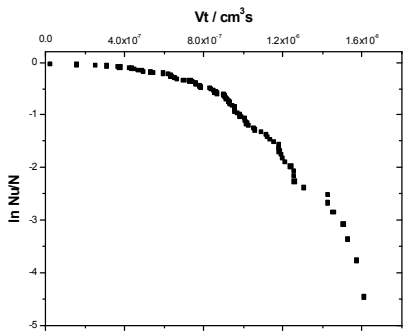
T-meas: -55.36 °C, JL=   , JR=   (Trap B)
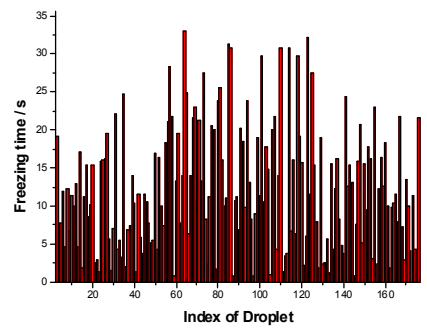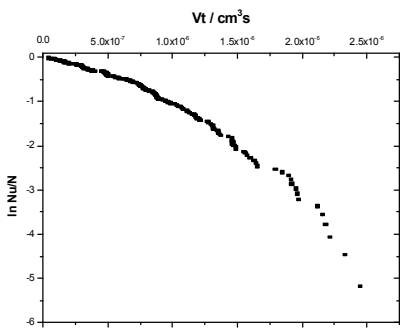
T-meas: -55.39 °C, JL=   , JR=   (Trap B)
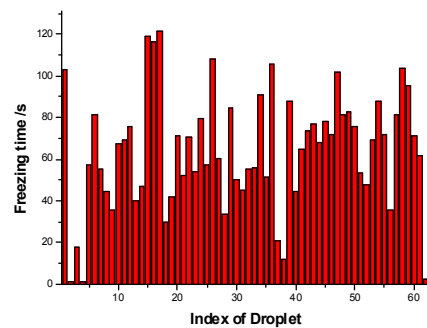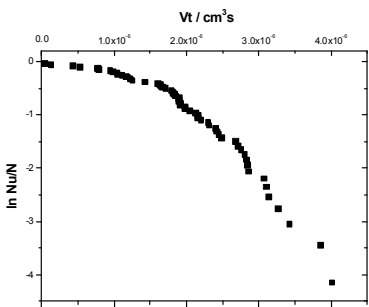
T-meas: -55.47 °C, JL=   , JR=   (Trap B)
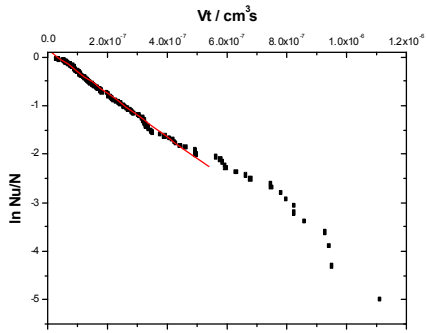
T-meas: -55.51 °C, JL=   , JR=4.49 E6 (Trap B)
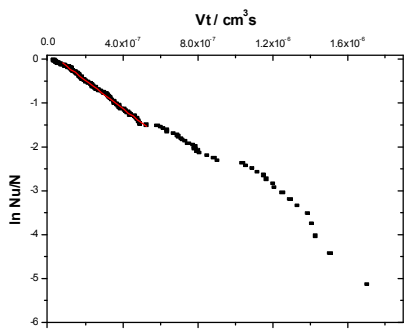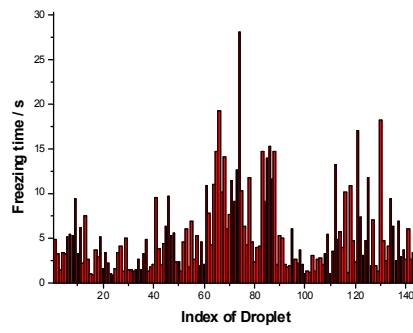
T-meas: -55.64 °C, JL=   , JR=3.25 E6 (Trap B)
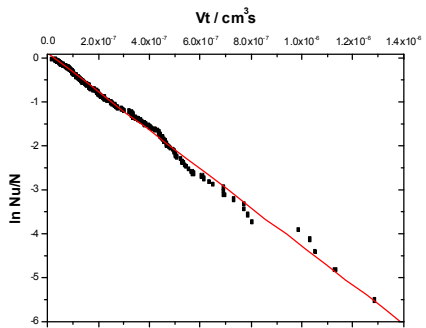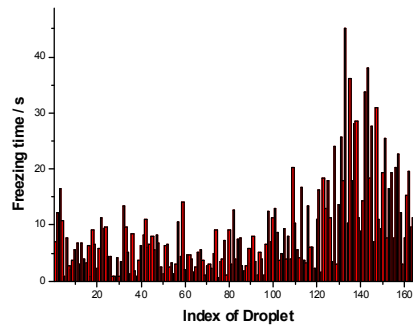
T-meas: -55.77 °C, JL= 4.41 E6 (Trap B)
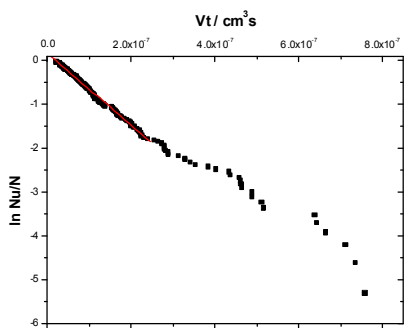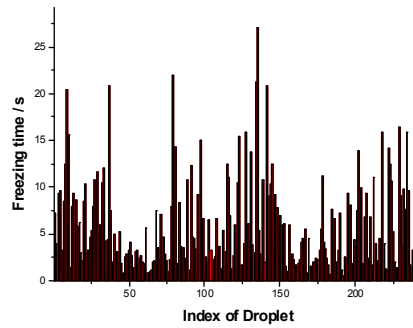
T-meas: -55.86 °C, JL= 8.23 E6 (Trap B)
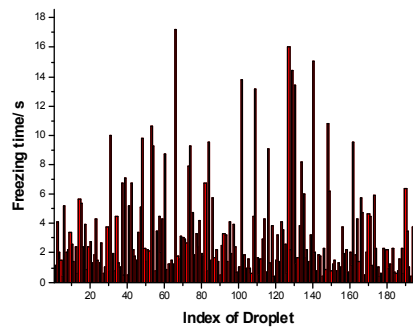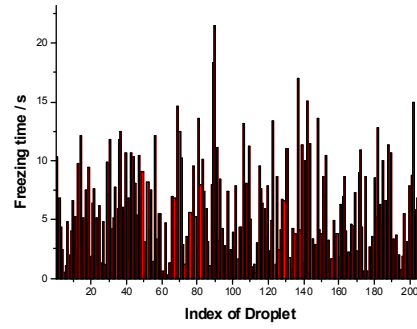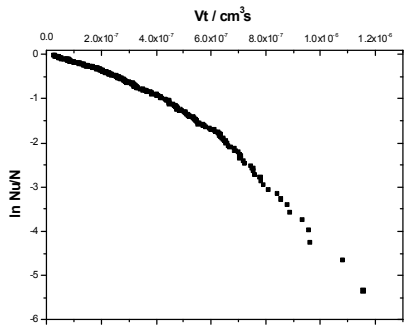
T-meas: -55.87 °C, J =   (Trap B)
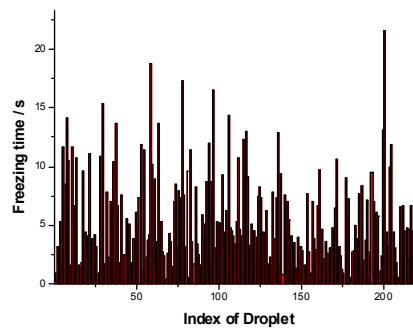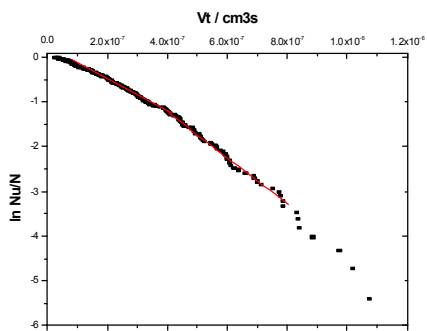
T-meas: -55.97 °C, JL= 3.58 E6, JR= 5.13 E6 (Trap B)
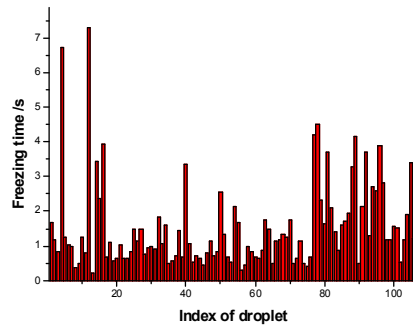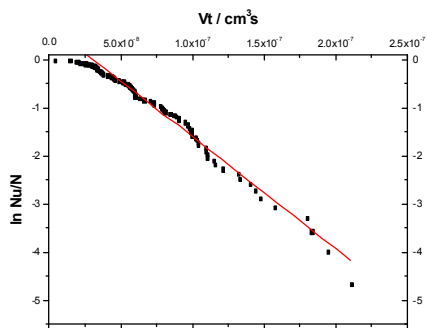
T-meas: -56.16 °C, JR= 2.32 E7 (Trap B)

Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.136
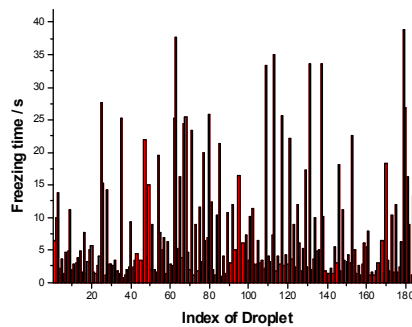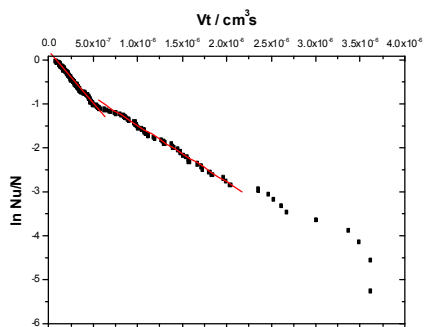
T-meas: -55.66 °C, JL= 2.39 E6, JR= 1.28 E6 (Trap B)
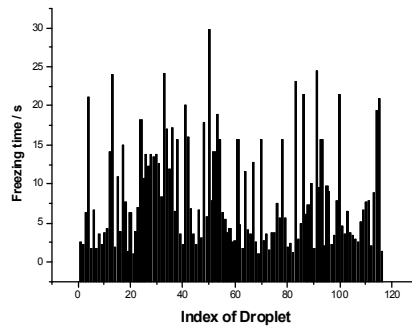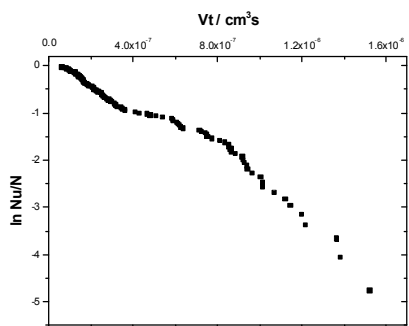
T-meas: -55.66 °C (Trap B)
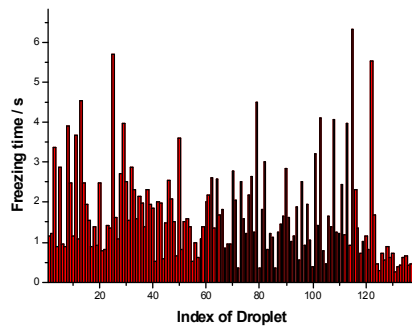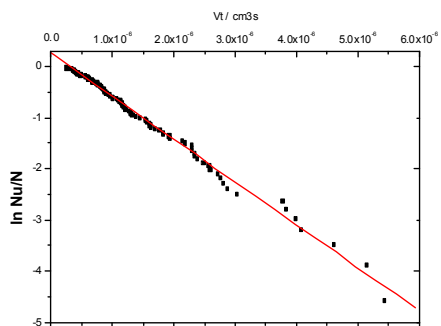
T-meas: -55.89 °C, JR= 8.37 E6 (Trap B)
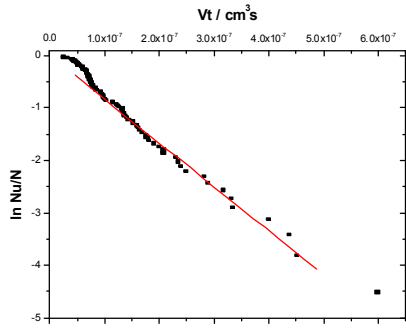
T-meas: -55.94 °C, JR= 8.36 E6 (Trap B)
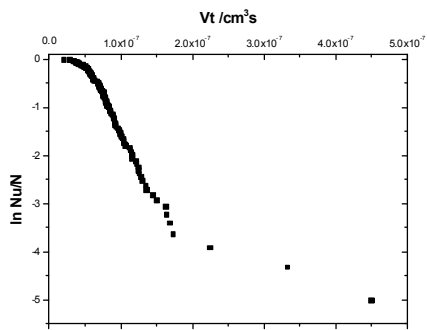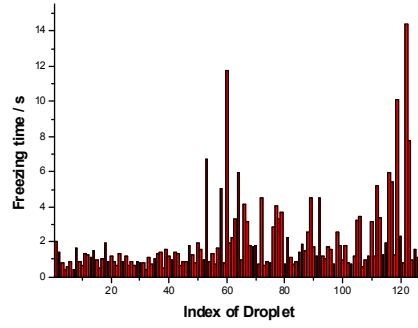
T-meas: -56.11 °C (Trap B)
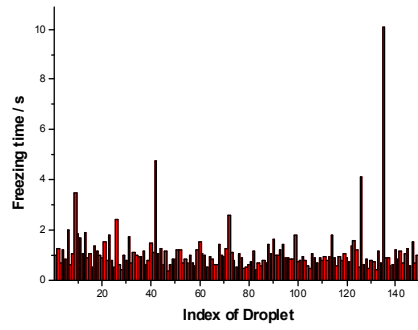
Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.143
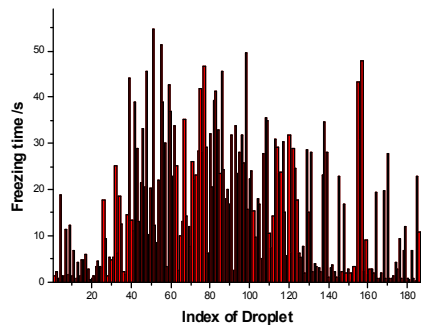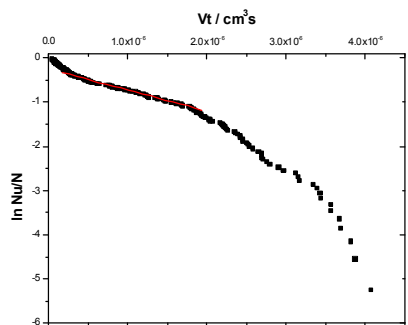
T-meas: -56.18 °C, JL= 4.79 E5 (Trap B)
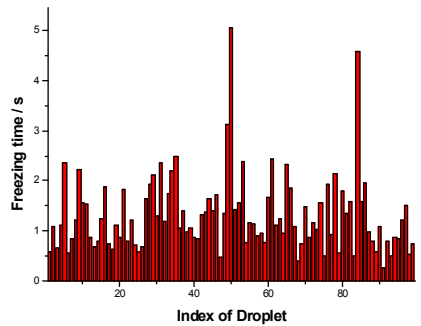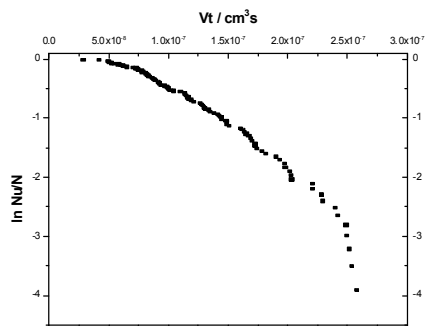


T-meas: -56.22 °C, JL=   (Trap B)
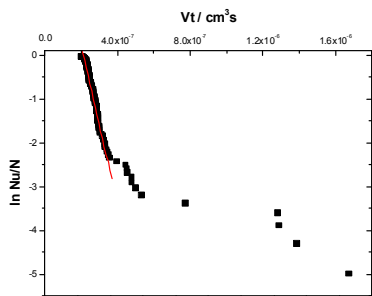
T-meas: -56.30 °C, JL= 1.63 E7 (Trap B)

Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.163
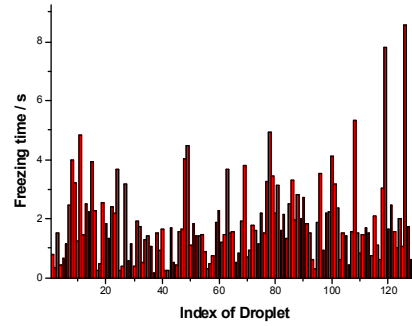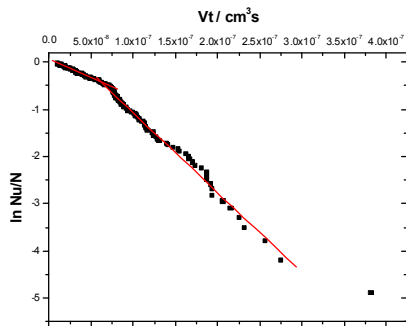
T-meas: -56.24 °C, JL=7.68 E6, JR=1.69 E7 (Trap B)
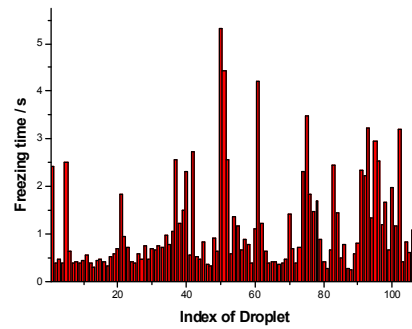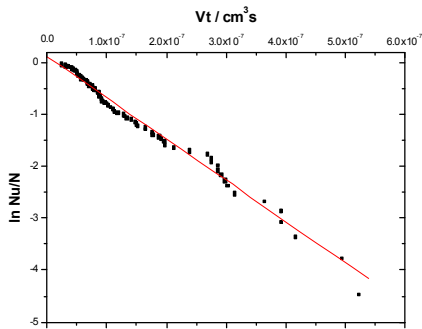

T-meas.: -56.35 °C, J = 7.95 E6 (Trap B)
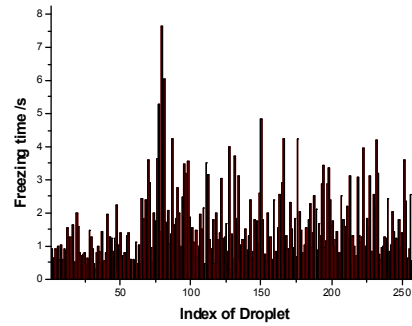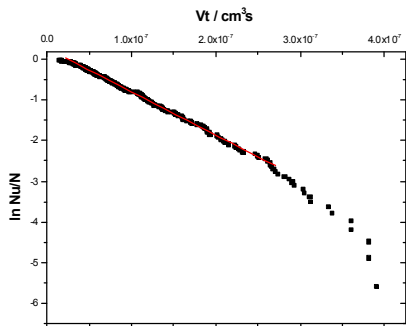
T-meas.: -56.36 °C, J = 1.07 E7 (Trap B)
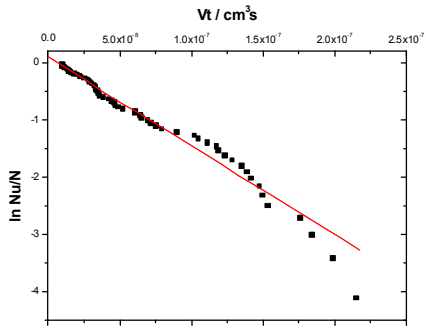
T-meas.: -56.85 °C, J = 1.54 E7 (Trap B)
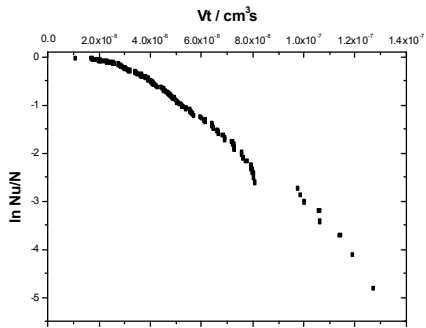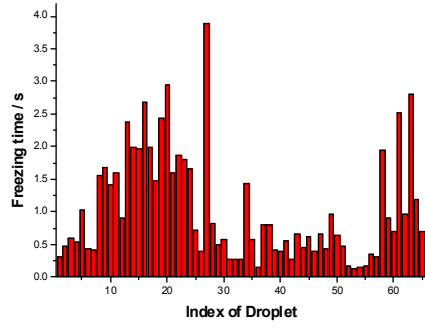
T-meas: -56.97 (Trap B)
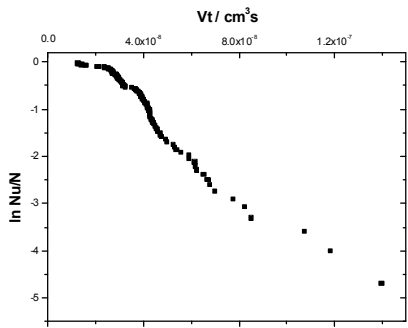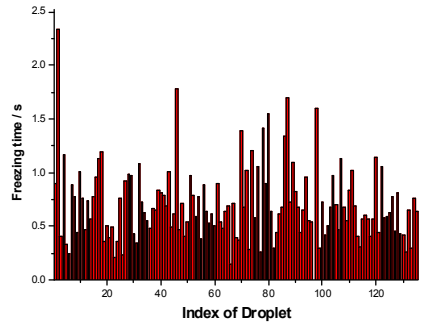
T-meas: -57.11 (Trap B)
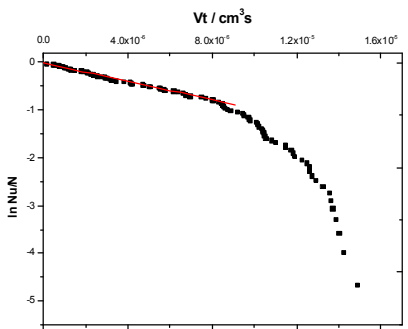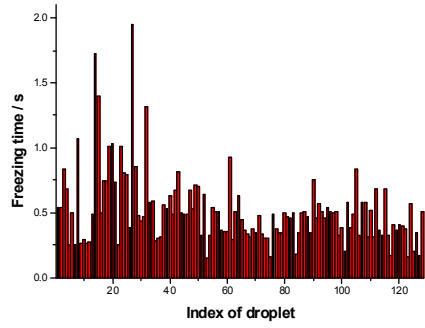
T-meas.: -56.10 °C, J = 9.67 E4 (Trap A)
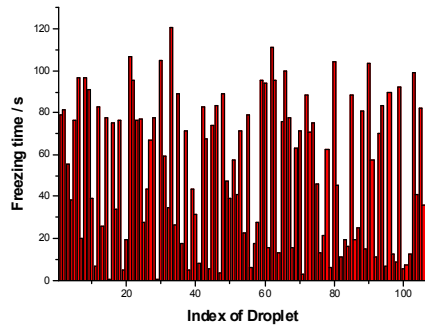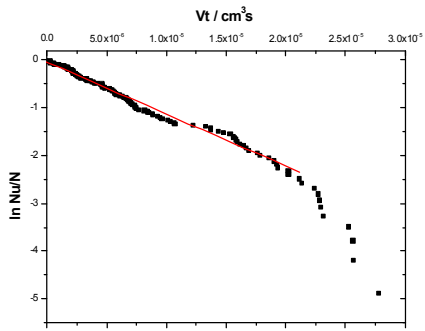
T-meas.: -56.11 °C, J = 1.09 E5 (Trap A)
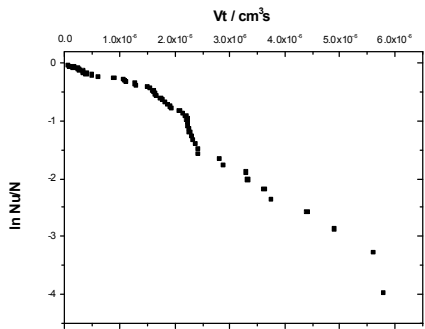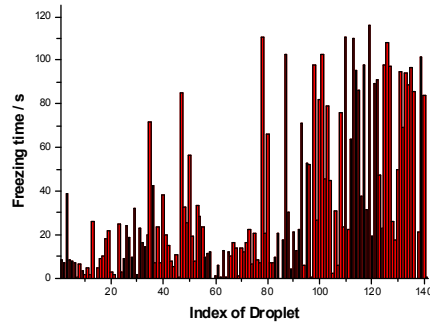
T-meas.: -56.14 °C (Trap A)
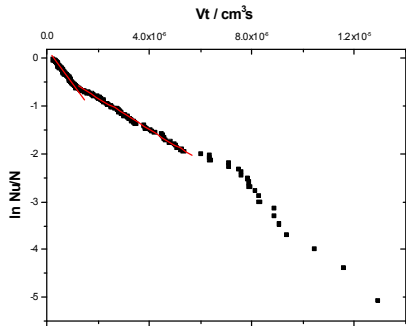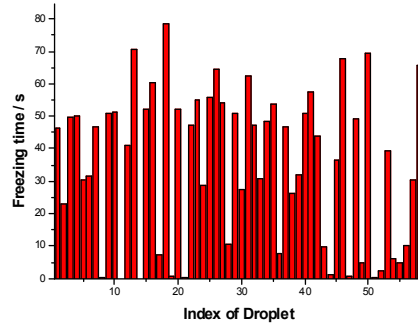
T-meas: -56.23 °C, JL=6.8 E5, JR=3.3 E5 (Trap A)
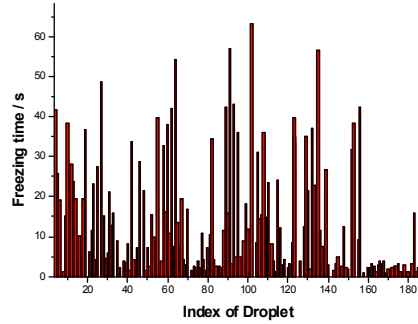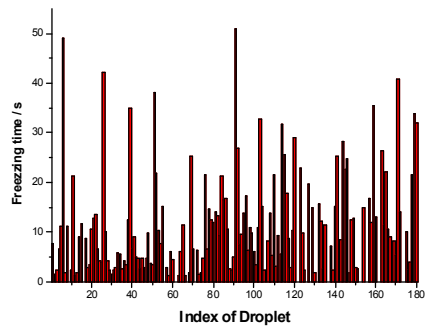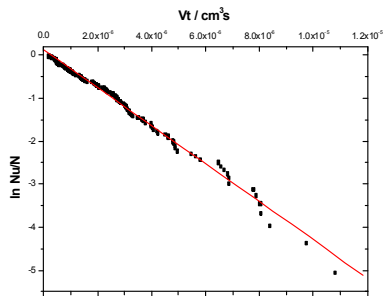
T-meas.: -56.34 °C, J = 4.42 E5 (Trap A)
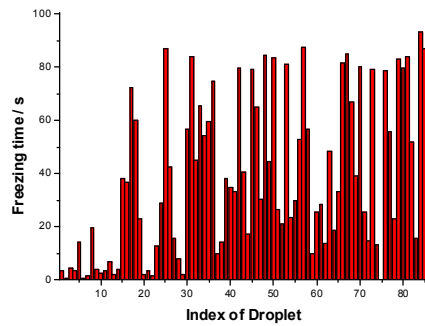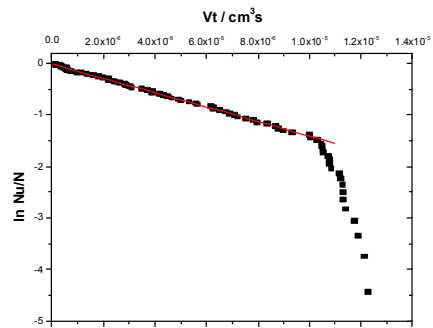
T-meas.: -56.51 °C, J = 1.39 E5 (Trap A)
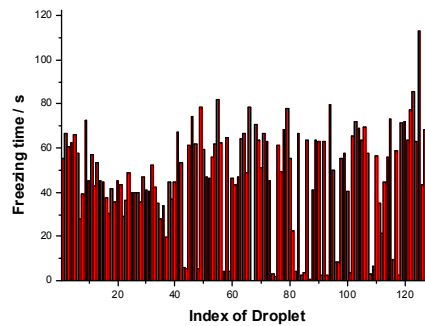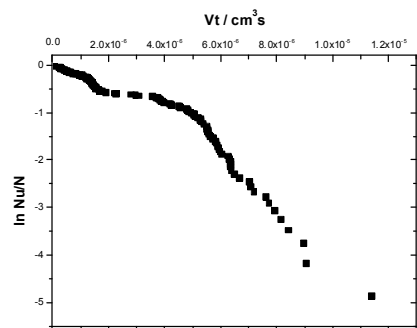
T-meas.: -56.54 °C (Trap A)
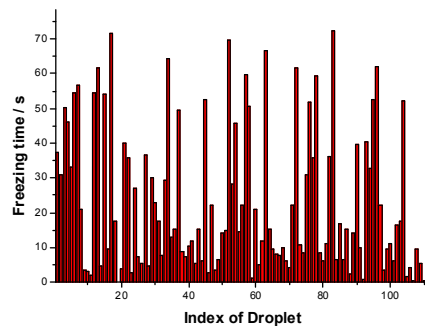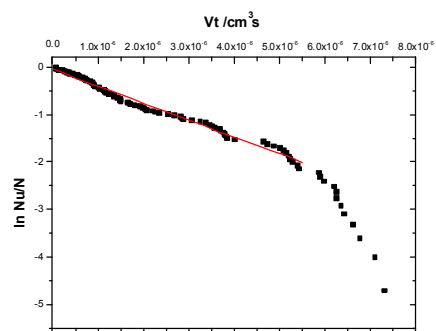
T-meas.: -56.70 °C, J = 3.57 E5 (Trap A)
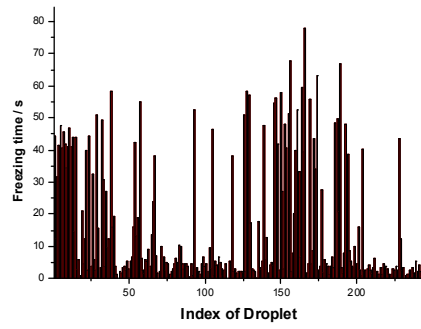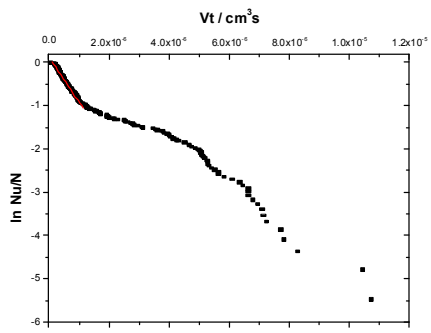
T-meas.: -56.96 °C, J = 1.04 E6 (Trap A)
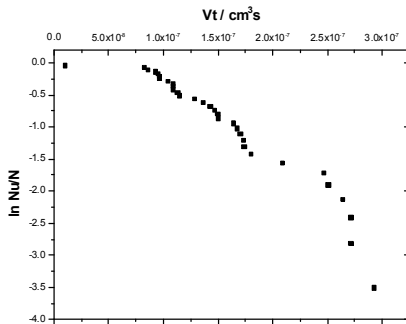
Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.207
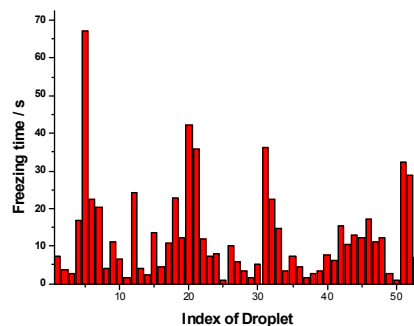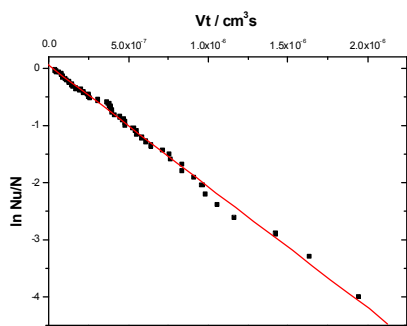
T-meas: -55.16 °C, J = 2.12 E6 (Trap B)
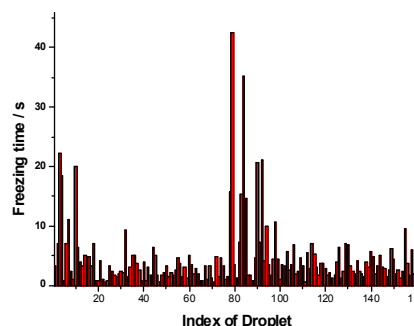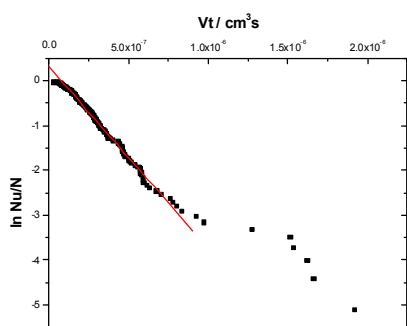
T-meas: -55.31 °C, J = 4.05 E6 (Trap B)
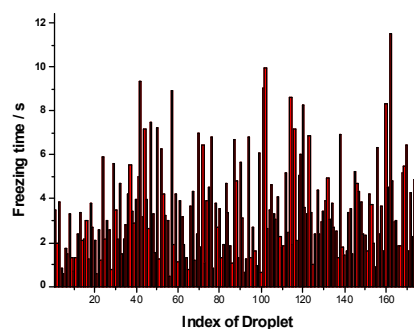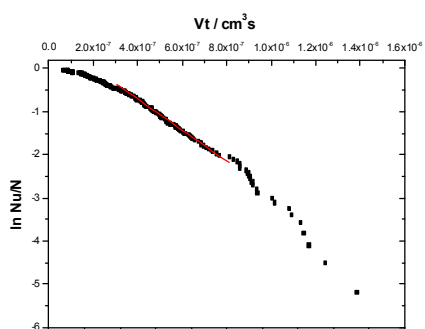
T-meas: -55.51 °C, JR = 5.76 E6 (Trap B)
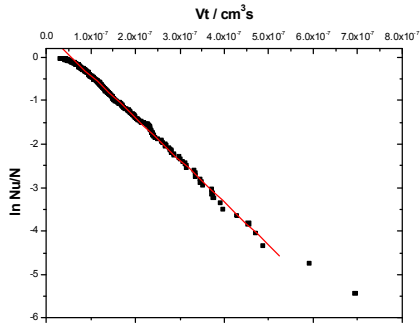
T-meas: -55.81 °C, JR = 9.72 E6 (Trap B)
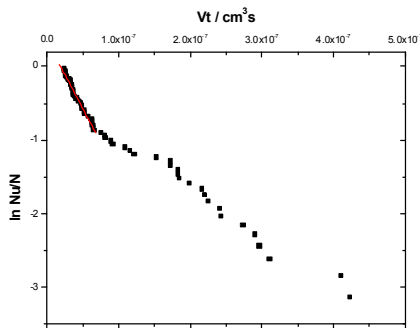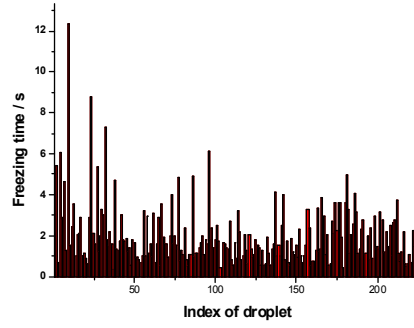
T-meas: -55.88 °C, JL = 1.85 E7 (Trap B)
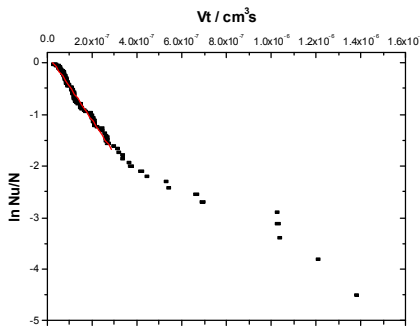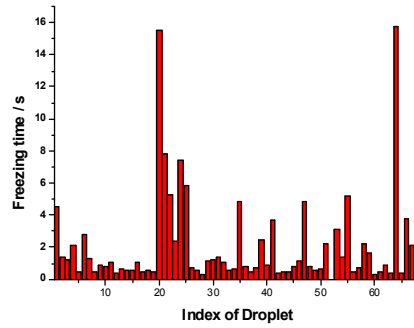
T-meas: -56.08 °C, JL = 6.45 E6 (Trap B)
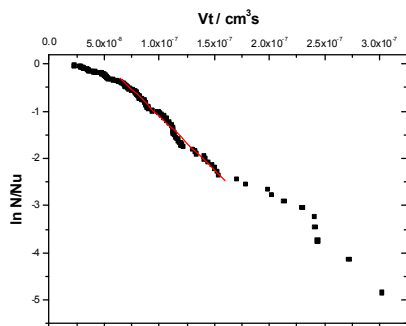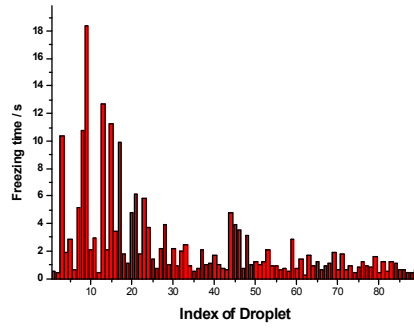
T-meas: -56.22 °C, JR = 2.27 E7 (Trap B)
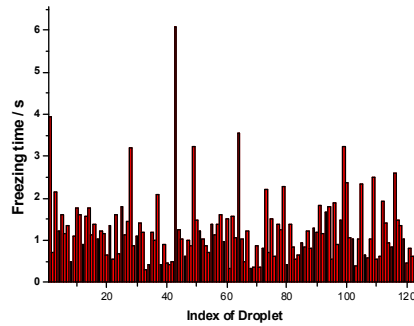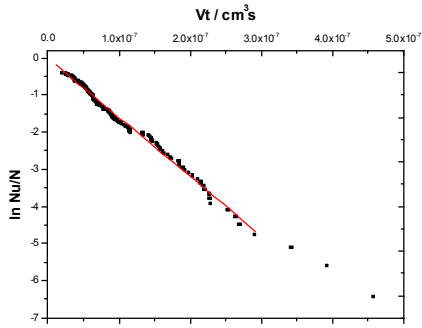
T-meas: -56.29 °C, JL = 1.33 E7 (Trap B)
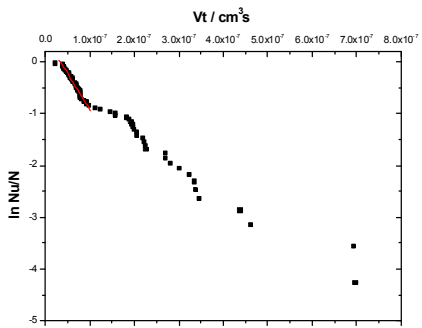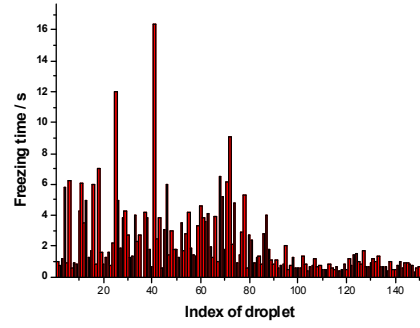
T-meas: -56.31 °C, JL = 1.4 E7 (Trap B)
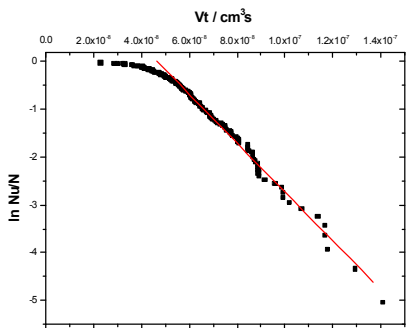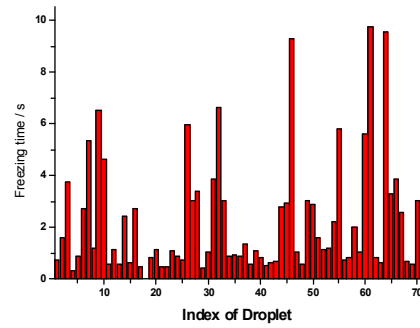
T-meas: -56.63 °C, JR = 5.14 E7 (Trap B)
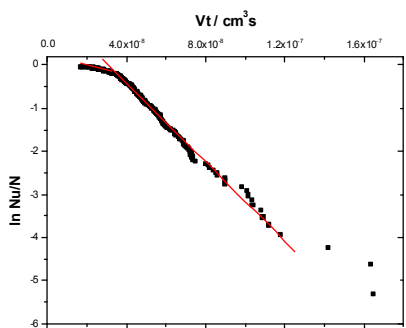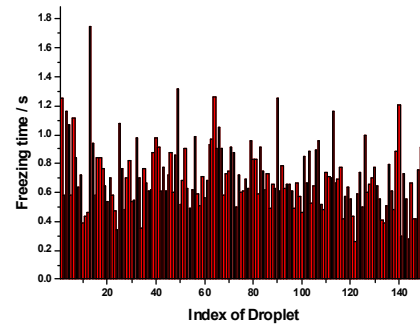
T-meas: -56.88 °C, JL= 1.06 E7, JR = 4.56 E7 (Trap B)
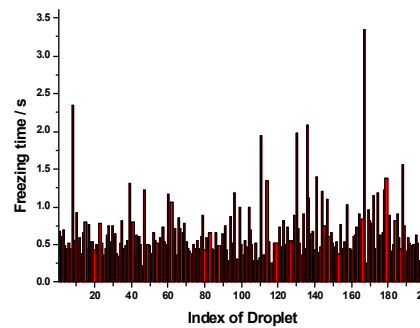
Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.3
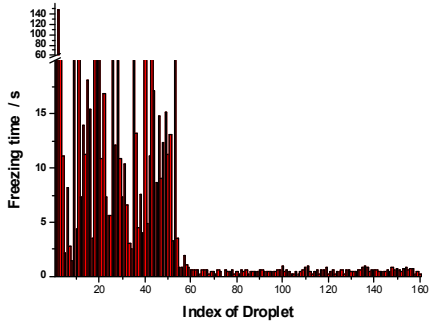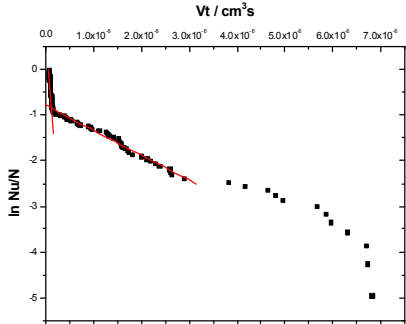
T-meas: -51.14 °C, J_L= 1.27 E7, J_R= 5.45 E5 (Trap A)
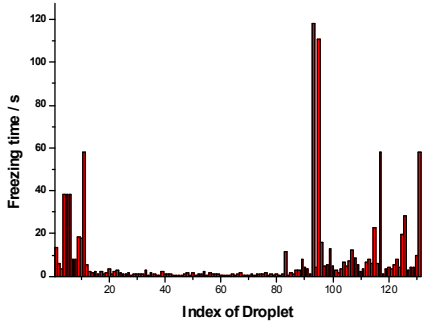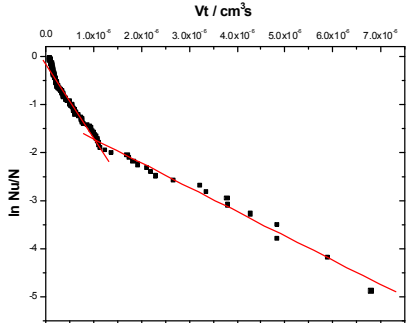
T-meas: -51.44 °C, J_L= 1.56 E6, J_R= 5.05 E5 (Trap A)
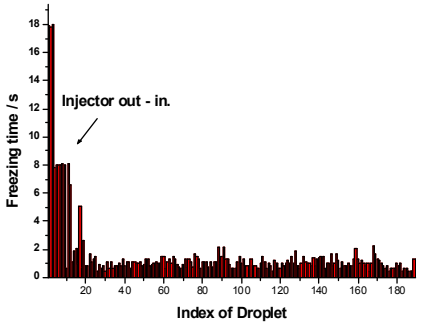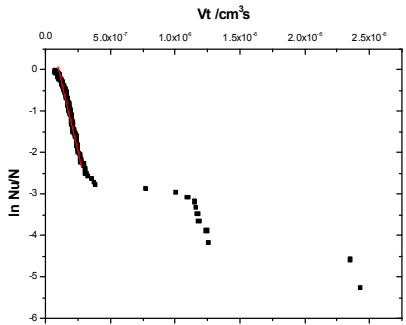
T-meas: -51.84 °C, J_R=1.33 E7 (Trap A)
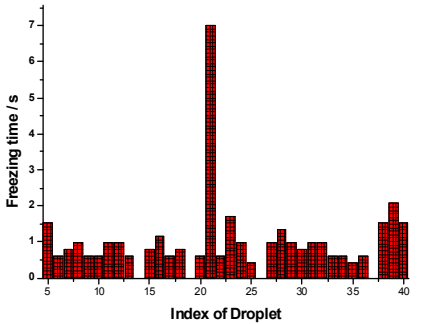
T-meas: -53.65 °C (Trap A)

Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.363
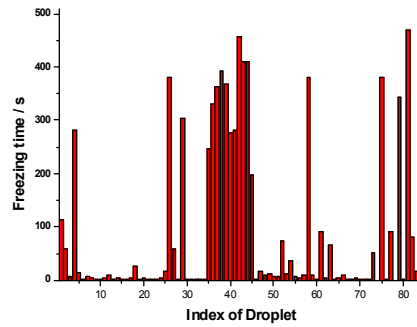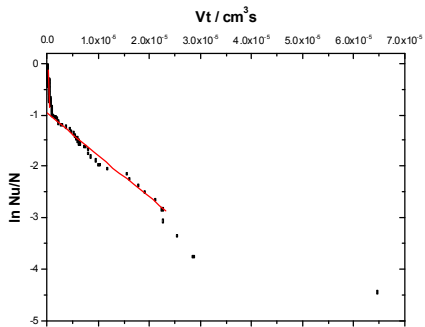
T-meas: -51.61 °C, J_L= 1.90 E6, J_R= 8.18 E4 (Trap B)
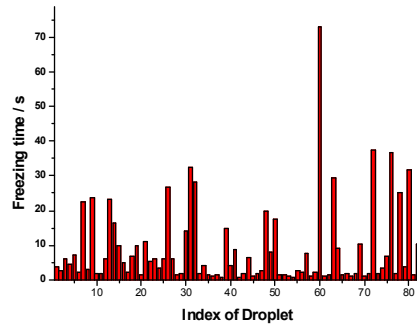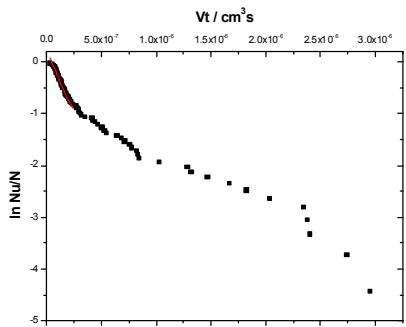
T-meas: -51.68°C, J_L= 4.64 E6 (Trap B)
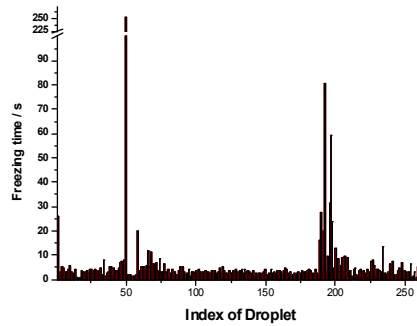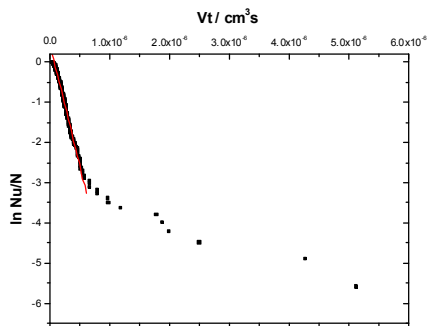
T-meas: -51.70°C, J_L= 6.03 E6 (Trap B)
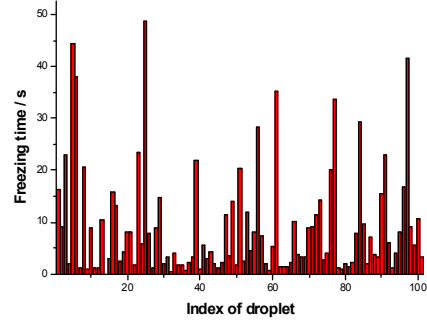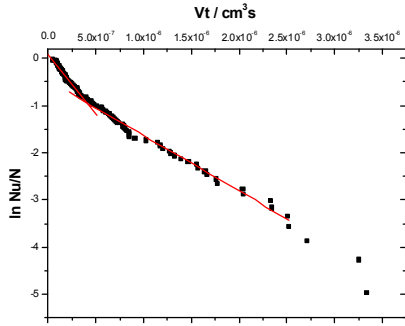
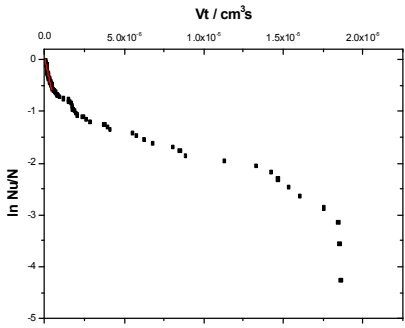T-meas: -51.72 °C, J_L= 2.70 E6, J_R= 1.17 E6 (Trap B)
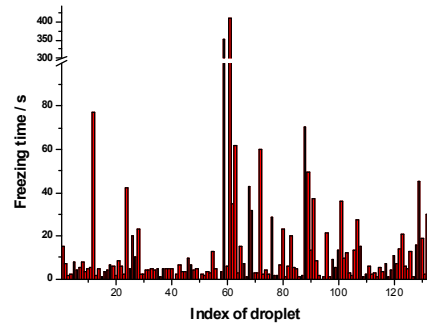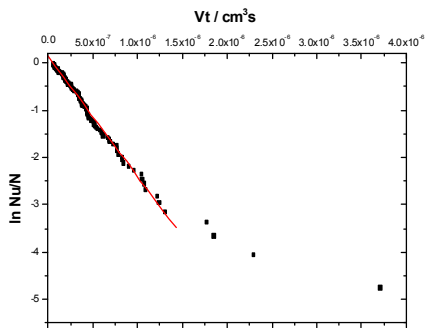
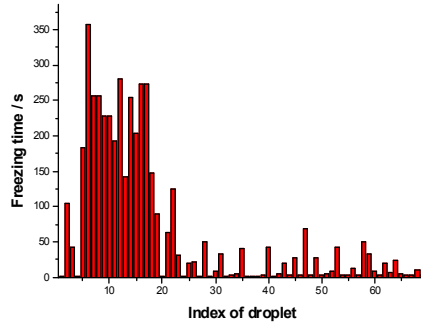T-meas: -51.84 °C, J= 2.54 E6 (Trap B)
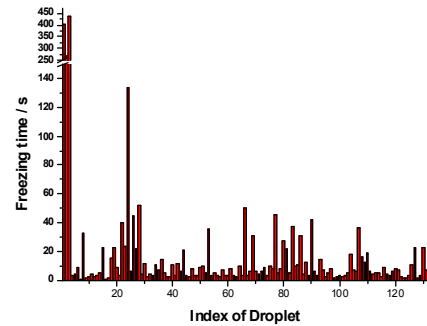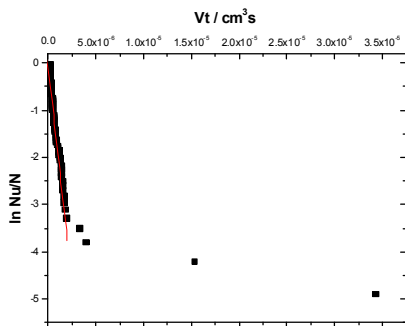
T-meas: -51.87°C, J_L= 1.79 E6 (Trap B)
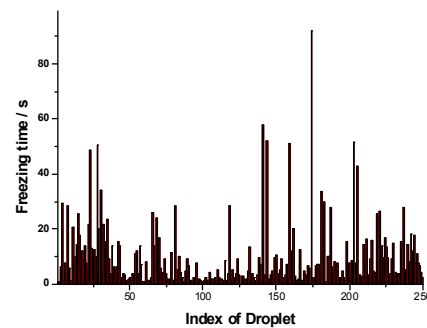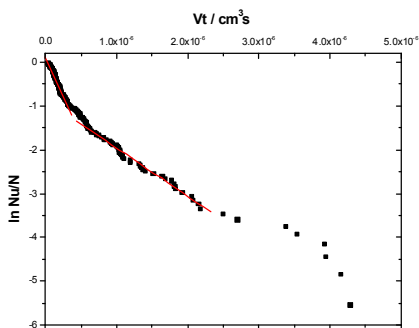
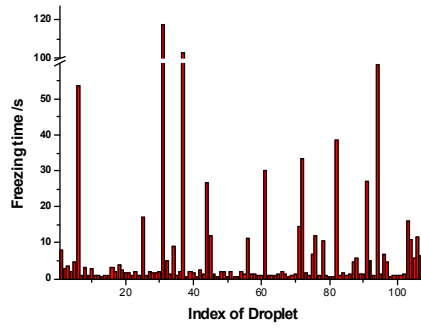
T-meas: -52.03 °C, J_L= 3.65 E6, J_R= 1.10 E6 (Trap B)
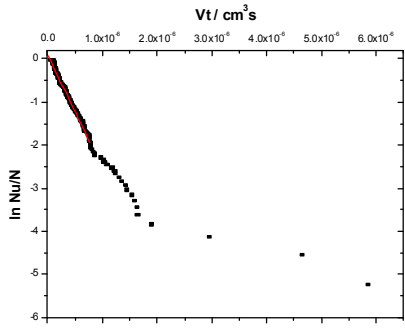
T-meas: -52.04 °C, J_L= 2.63 E6 (Trap B)
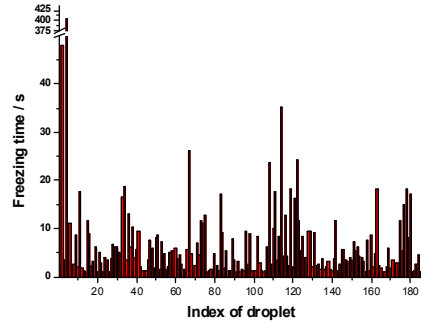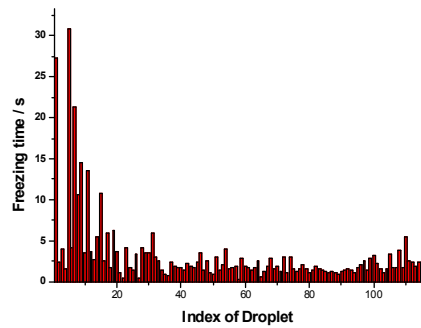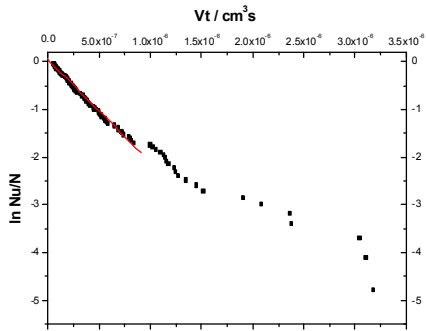

T-meas: -52.11 °C, J_L= 1.41 E6 (Trap B)
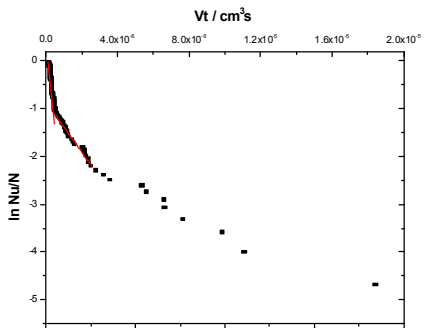
T-meas: -52.12 °C, J_L= 3.03 E6, J_R= 5.22 E5 (Trap B)
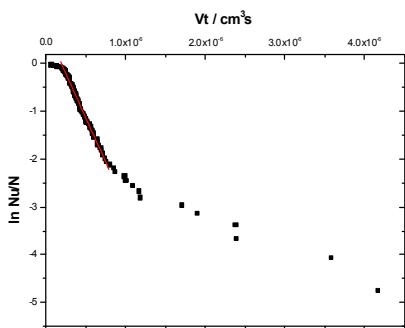
T-meas: -52.14 °C, J_R= 3.73 E6 (Trap B)
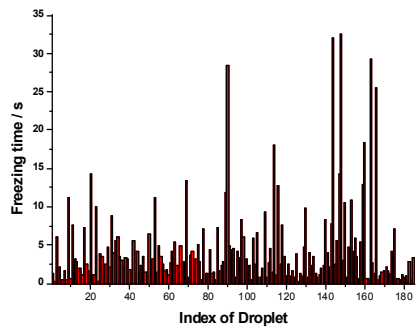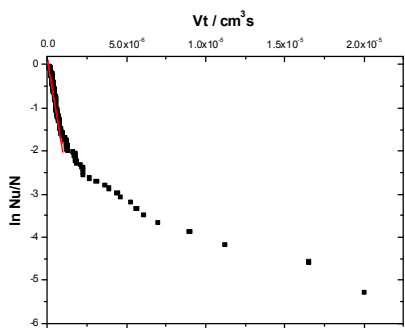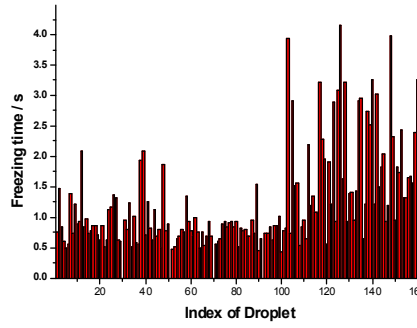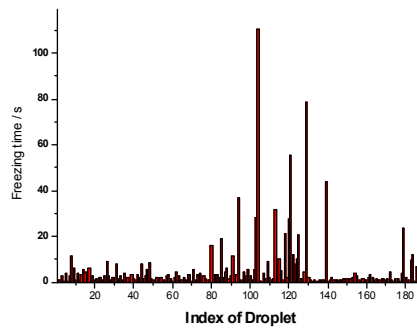
T-meas: -52.24 °C, J_L= 2.15 E6 (Trap B)
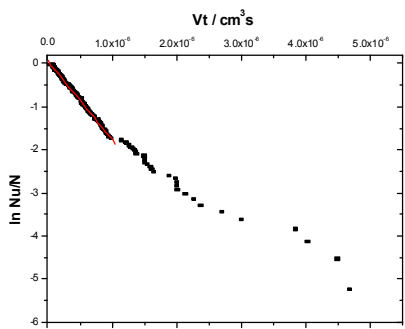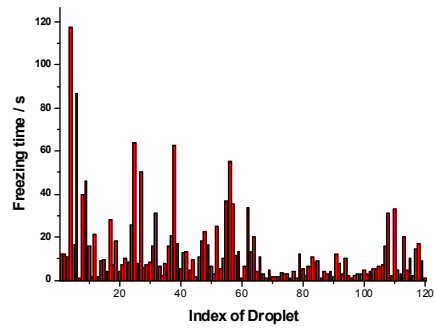
T-meas: -52.26 °C, J_L= 1.85 E6 (Trap B)
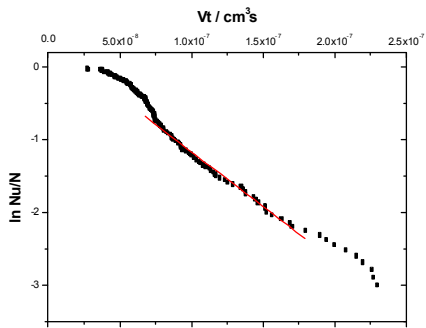
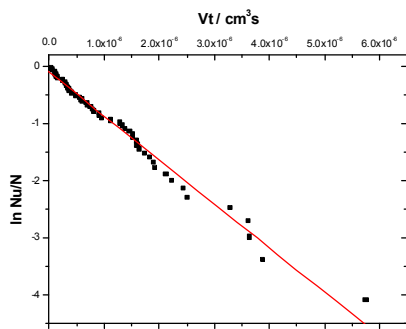T-meas: -52.27 °C, J_L= 1.50 E7 (Trap B)
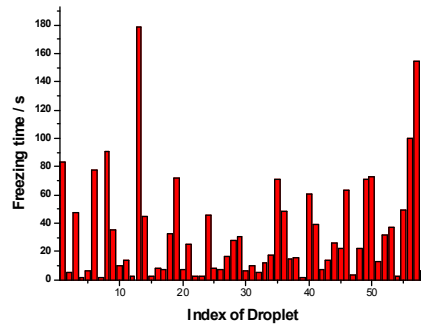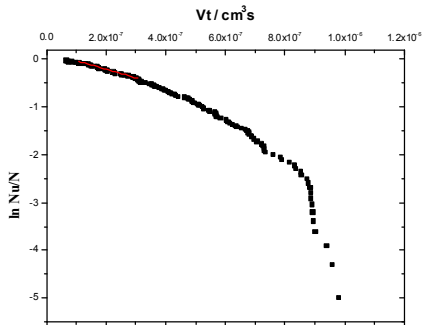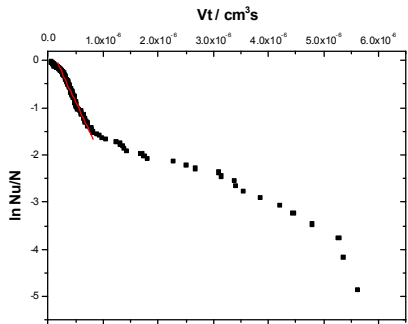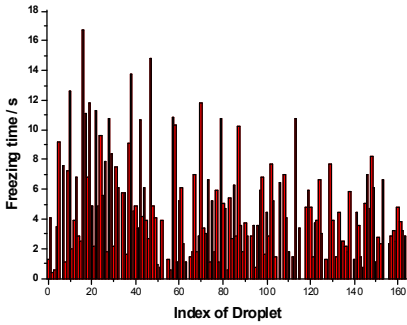

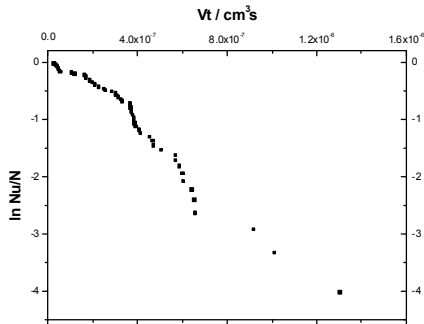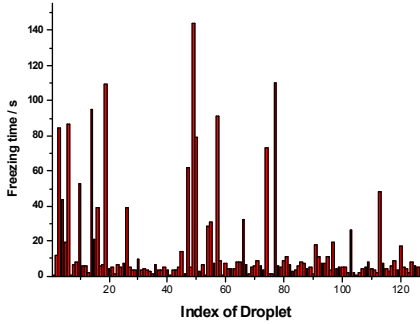T-meas: -52.41 °C, J_L= 2.25 E6 (Trap B)

T-meas: -52.75 °C, J = 7.68 E5 (Trap B)

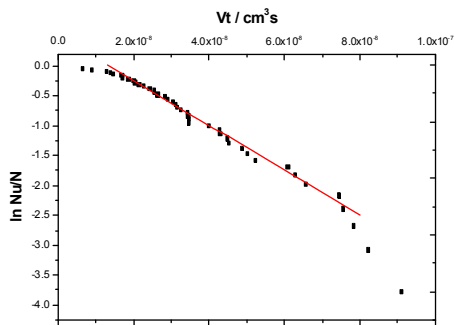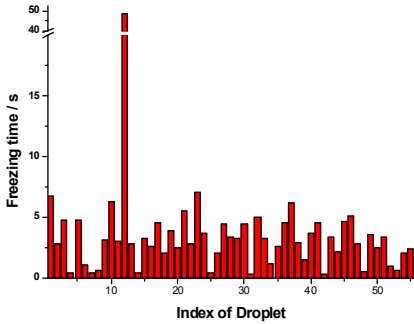# Water + 1, 4-Dioxane Binary Liquid Mixture - x_{diox} = 0.477

T-meas: -36.92 °C, J_L=1.73 E6 (Trap A)

T-meas: -47.06 °C, J_2=2.51 E6 (Trap B)

T-meas: -47.33 °C (Trap B)

T-meas: -47.69 °C, J_R=3.73 E7 (Trap B)