



Dipartimento di  
Scienze Chimiche

# *“ Water Memory “*

## *A Physico-Chemical Study*



*V. Elia, E. Napoli*





*Il Paradigma segna il confine tra 'scienza' e 'non scienza'*

*I paradigmi però nascono , si sviluppano e poi declinano e devono essere sostituiti quando le nuove scoperte scientifiche si rivelano incompatibili.*

*La società è riluttante ad abbandonare un paradigma consolidato e quindi i portatori di nuove idee appaiono come stravaganti , eretici , pericolosi.*

*Nella scienza non esistono gli eretici poiché non esistono dogmi.*





## *Methods*

*The perturbed water was obtained using the three different protocols:*

- *EDS (Extremely Diluted Solutions). Obtained through an iterative process of successive dilutions and agitations.*
- *IFW (Iteratively Filtered Water). Obtained through an iterative process of successive filtrations through sintered glass filters.*
- *INW (Iteratively Nafionized Water). Obtained through an iterative process of successive drying and wetting of the Nafion polymer.*



# *Protocol for the Preparation of a Homeopathic Solution*



## ➤ Iteration of two processes: dilution and dynamization

**Dynamization: violent shaking (*succussion*) of the solution in the vertical direction.**

**Example:**

**Active principle: NaCl      Solvent: H<sub>2</sub>O**

- **NaCl 1 CH solution: 1 g of NaCl + 99 g of H<sub>2</sub>O. The resulting solution is then succussed;**
- **NaCl 2 CH solution: 1 g of NaCl 1 CH + 99 g of H<sub>2</sub>O. The resulting solution is then succussed;**
- **NaCl n CH solution: 1 g of NaCl (n-1) CH + 99 g of H<sub>2</sub>O. The resulting solution is then succussed.**

*The label “n CH” (centesimal hanhemannian) reports the dilution degree (for n=1 ... n).*





*Il principio attivo, dopo le diluizioni, non è più presente.*

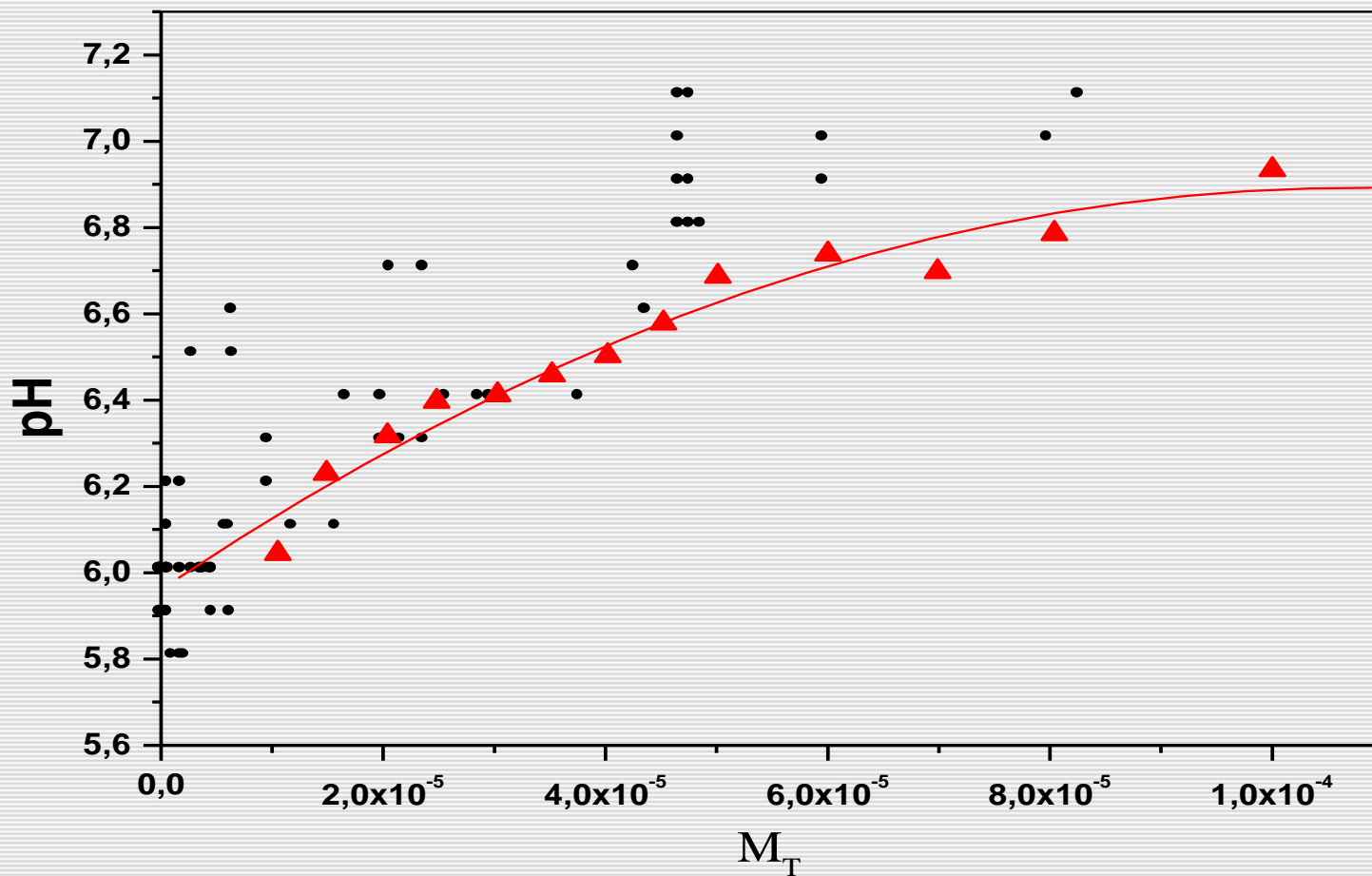
*Il solvente si è modificato e non possiede più i parametri chimico-fisici dell'acqua bidistillata.*

*Risultano variati:*

- *Conducibilità specifica elettrica*
- *pH*
- *Calore di mescolamento con acidi e basi*
- *Densità etc.....*



# *pH of EDS vs Concentration of the Chemical Contents*



*V. Elia, E. Napoli, R. Germano*

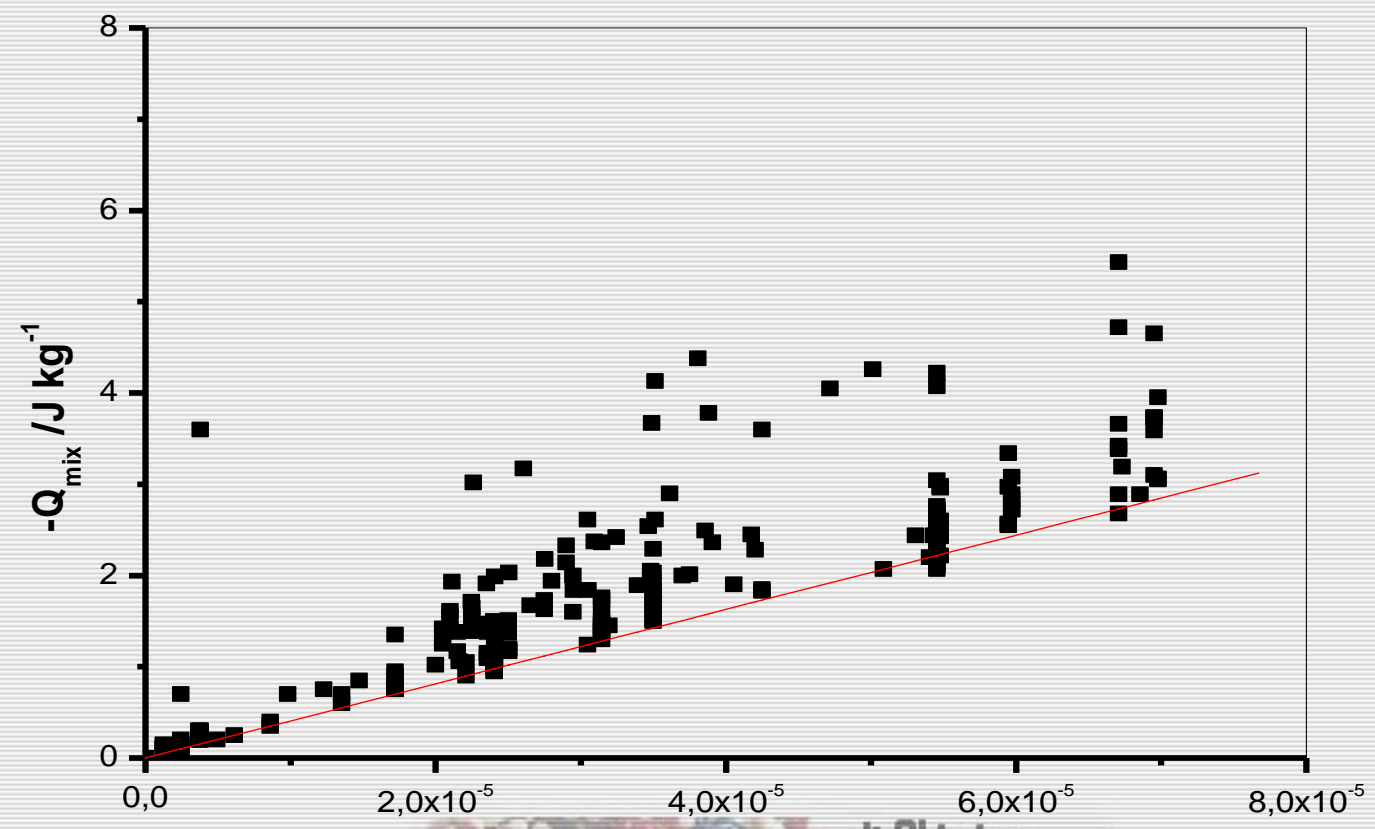
*Homeopathy, (2007) 96, 163-169 di Chimica*

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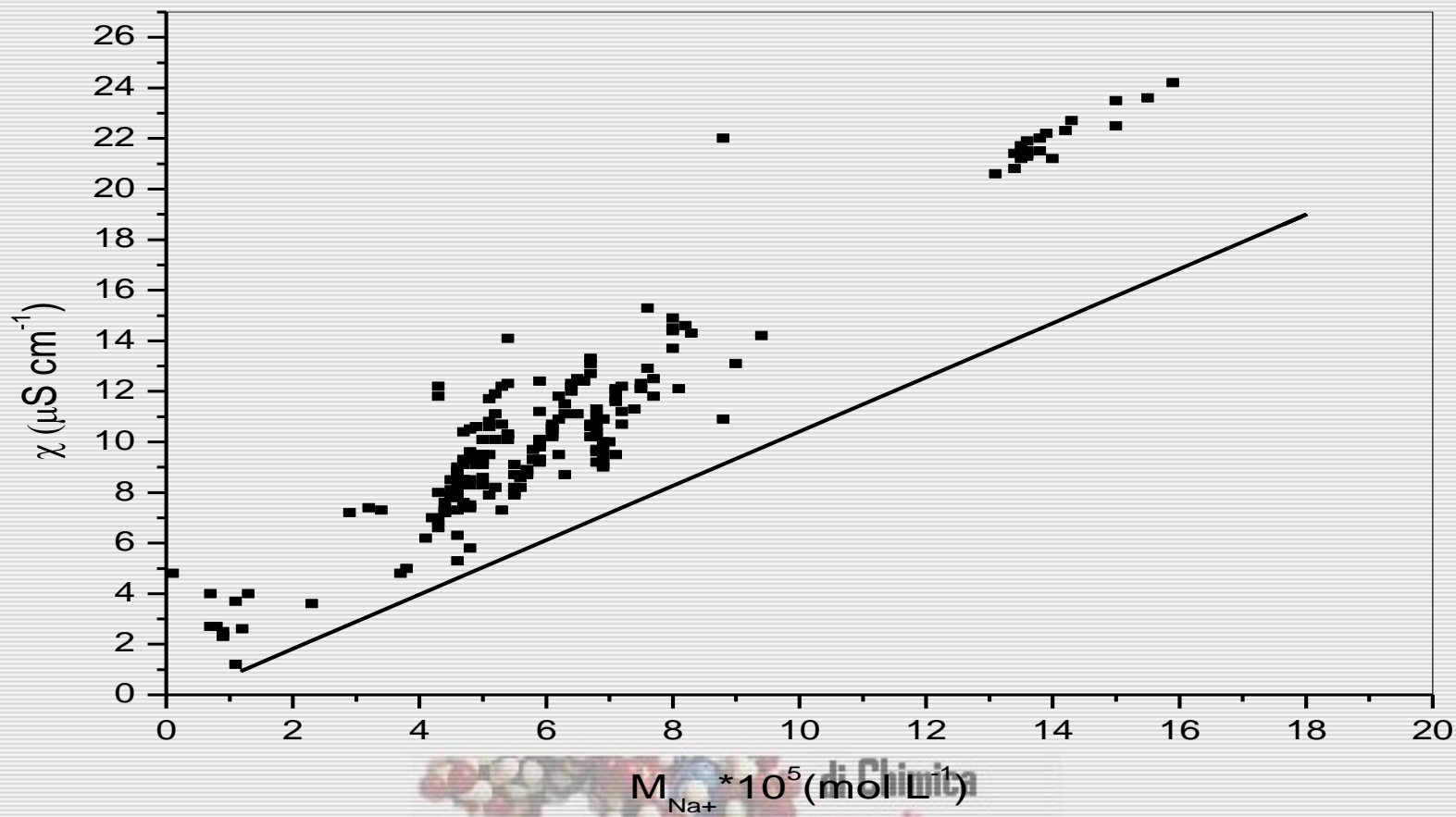




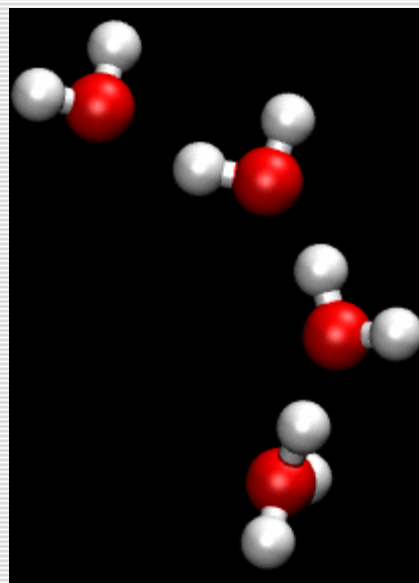
# *Heat of Mixing of EDS vs Concentration of the Chemical Contents*

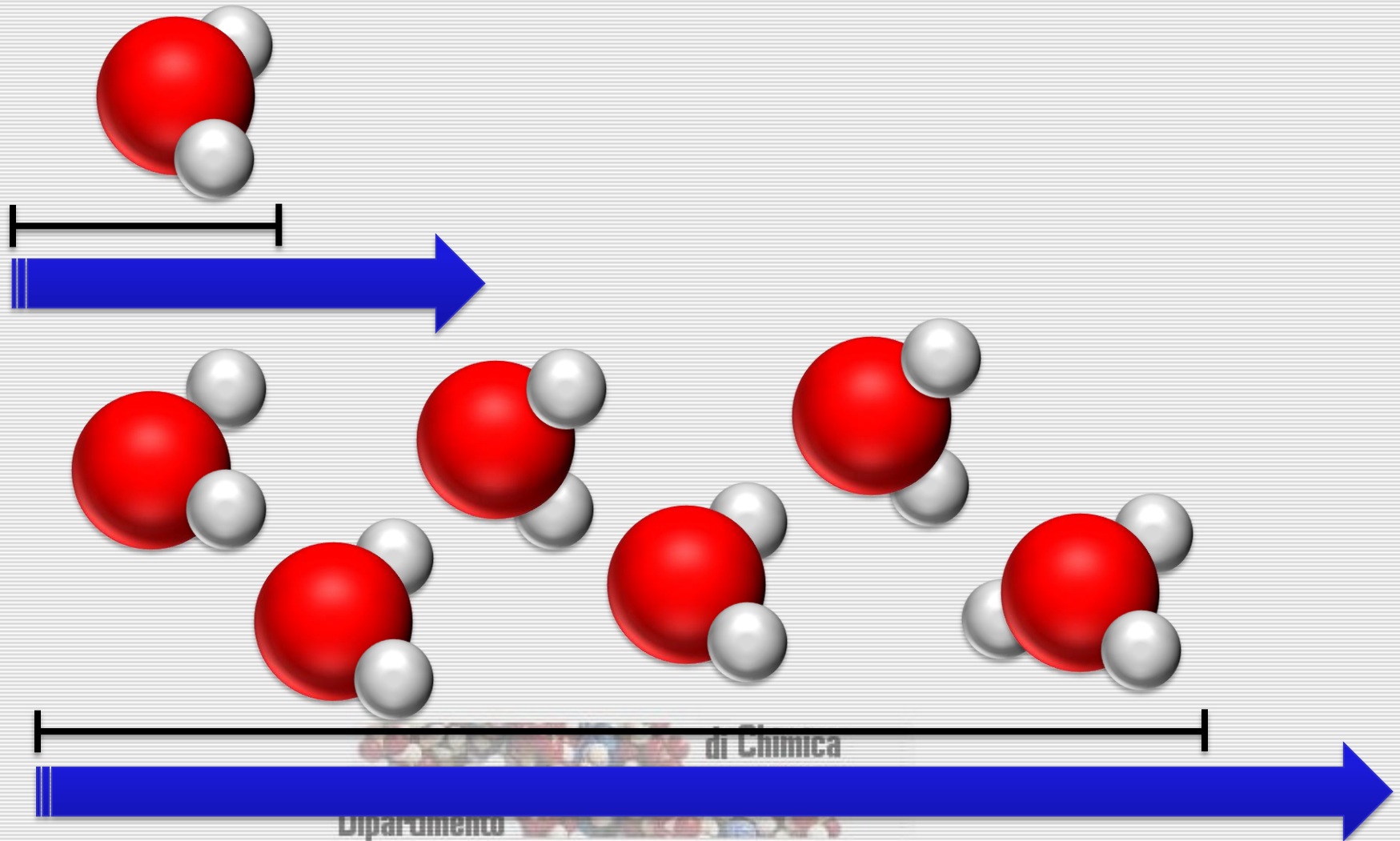


# *Specific conductivity of EDS compared to the concentration of the chemical content*











Sample	$\chi_i$	Experim./mg	Expected/mg	$\Delta_{mg}$
1	100,0	2,3	0,9	1,4
2	122,0	3,3	1,1	2,2
3	25,0	1,3	0,5	0,8
4	57,0	2,2	0,8	1,4
5	58,0	3,1	1,0	2,1
6	44,0	2,6	1,4	1,2
7	9,7	0,4	0,2	0,2
8	13,0	0,8	0,4	0,4
9	23,0	1,3	0,4	0,9
10	21,0	0,6	0,1	0,5
11	13,0	0,8	0,2	0,6
12	52,0	1,0	0,2	0,8
13	130,0	2,7	1,4	1,3
Glass Powder	$\chi_i$	Experim./mg	Expected/mg	$\Delta_{mg}$
1	68,0	3,1	3,1	0
2	8,5	0,3	0,2	0,1
3	18,0	1,2	1	0,2

*International Journal of Design and Nature – V. Elia, E. Napoli*

*Dissipative Structures in Extremely Diluted Solution of Homeopathic Medicines. A Molecular Model based on Physico-Chemical and Gravimetric evidences, 2010, Vol 5, N°1, 39-48*

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# *Solid in the vial (zoom)*

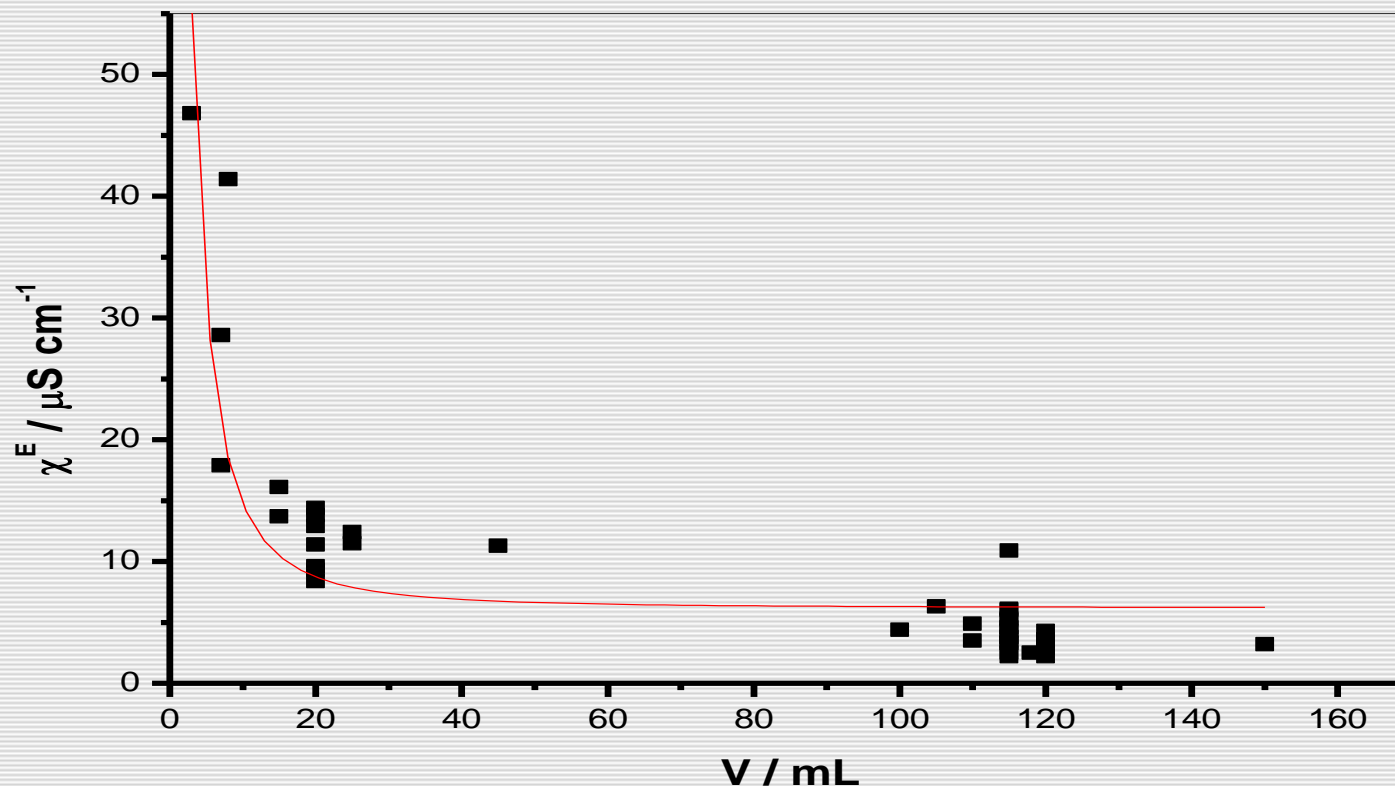


*It seems that there is a new component !*



# *Volume Effect and Ageing Effect*

# Excess Specific Electric Conductivity vs. Volume

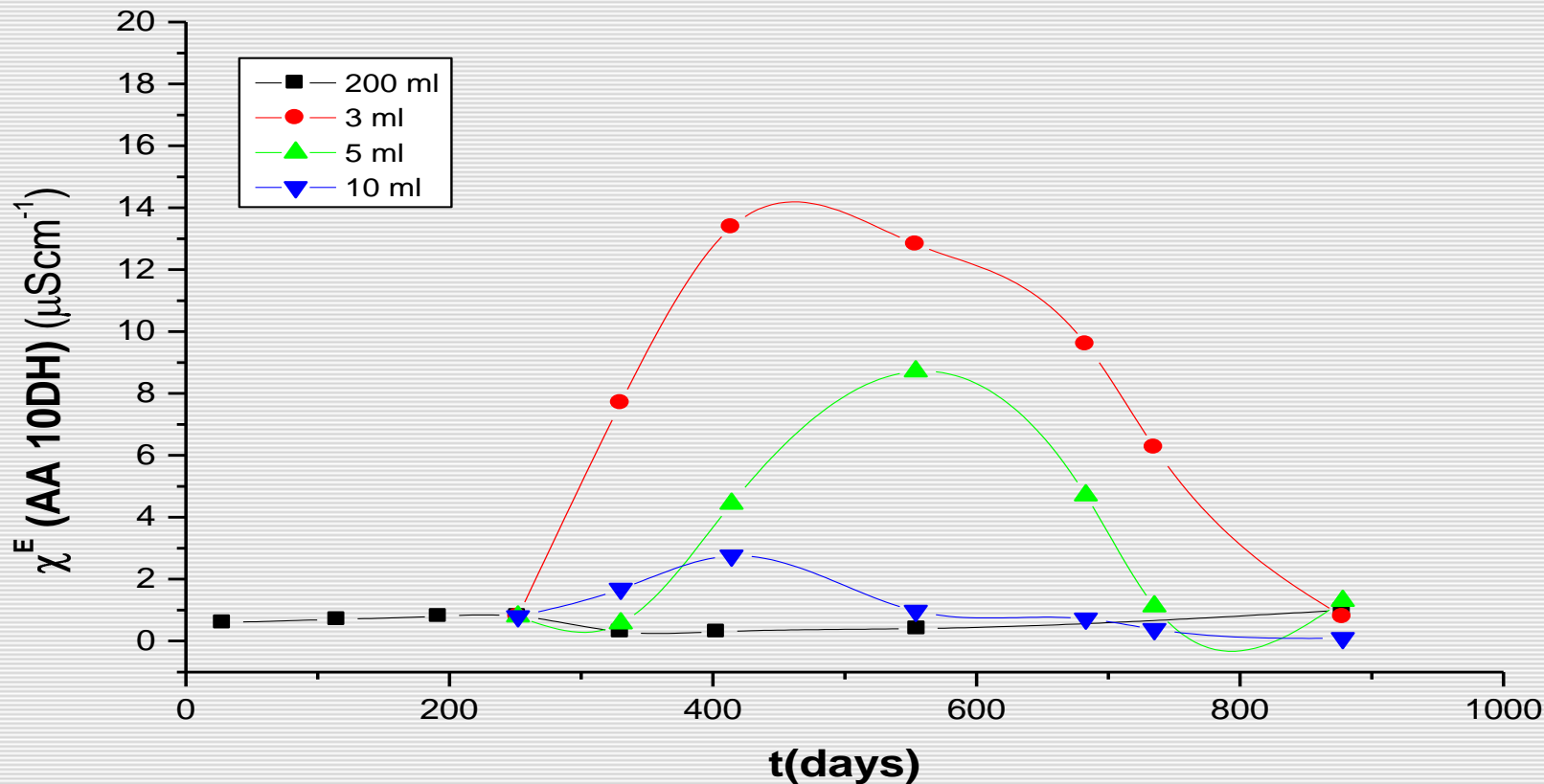


*V. Elia, L. Elia, E. Napoli, M. Niccoli*  
*"International Journal of Ecodynamics, Vol.1 No.4 (2007)"*



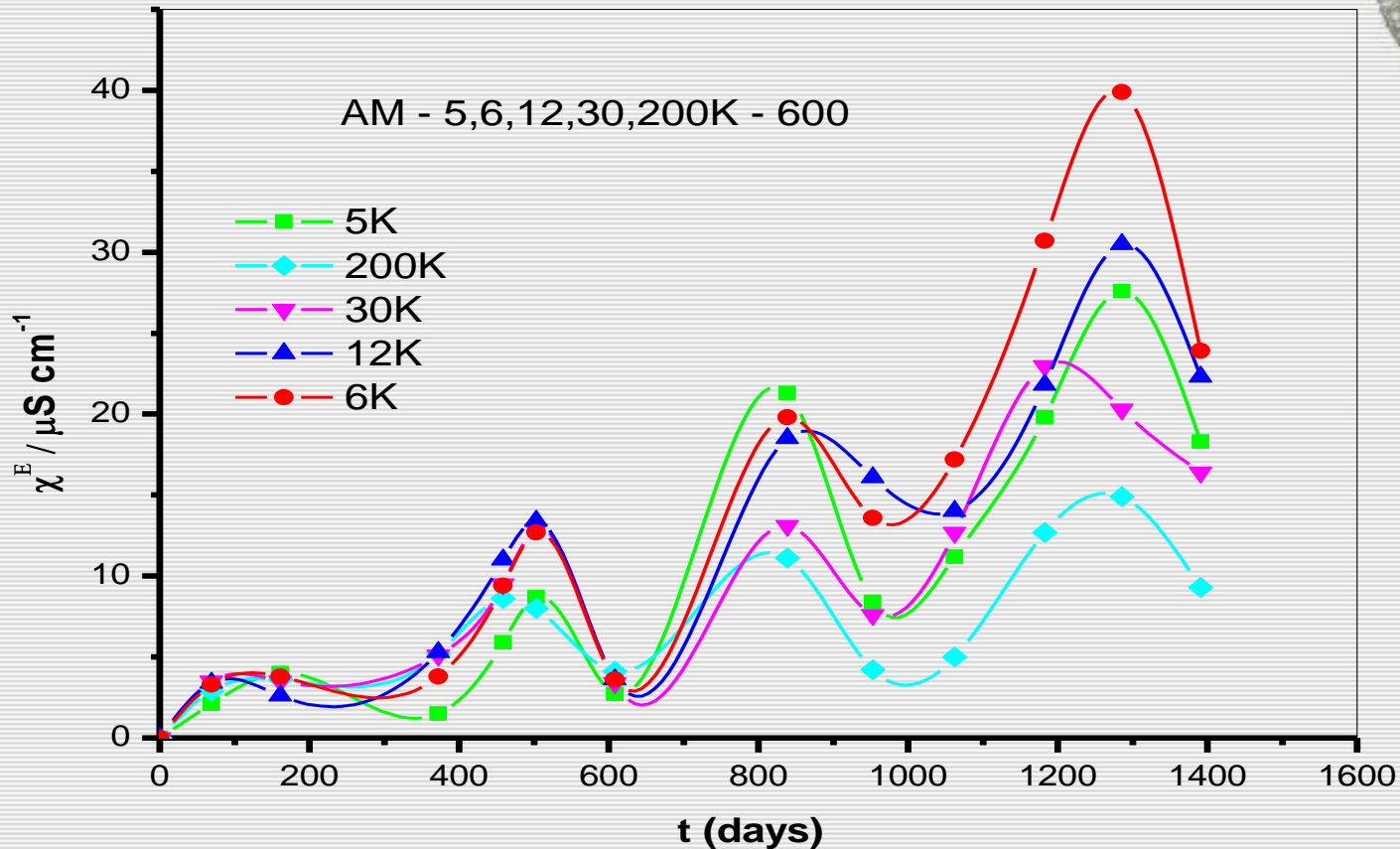


# Combined effect of Volume and Age



*P.Belon, V.Elia, L.Elia, M.Montanino, E.Napoli, M.Niccoli*  
*J. Thermal Analysis and Calorimetry, 2007, Vol.93(2), 459-469*

# Excess Conductivity vs time of AM 5,6,12,30,200CK



V.Elia, L.Elia, N. Marchettini, E.Napoli, M.Niccoli, E. Tiezzi  
*Journal of Thermal Analysis and Calorimetry*, 2008, Vol. 93 (3), 100

***Far-From-Equilibrium Systems.***

***«Dissipative Structures»***



*Tutto spinge ad ipotizzare, in  
assenza di soluto chimico, la  
presenza di aggregati di molecole  
di acqua!  
Strutture Dissipative*





*Per sistema dissipativo si intende  
un sistema termodinamicamente  
aperto che lavora in uno stato  
lontano dall'equilibrio  
di cui le celle di Benard sono un  
esempio*

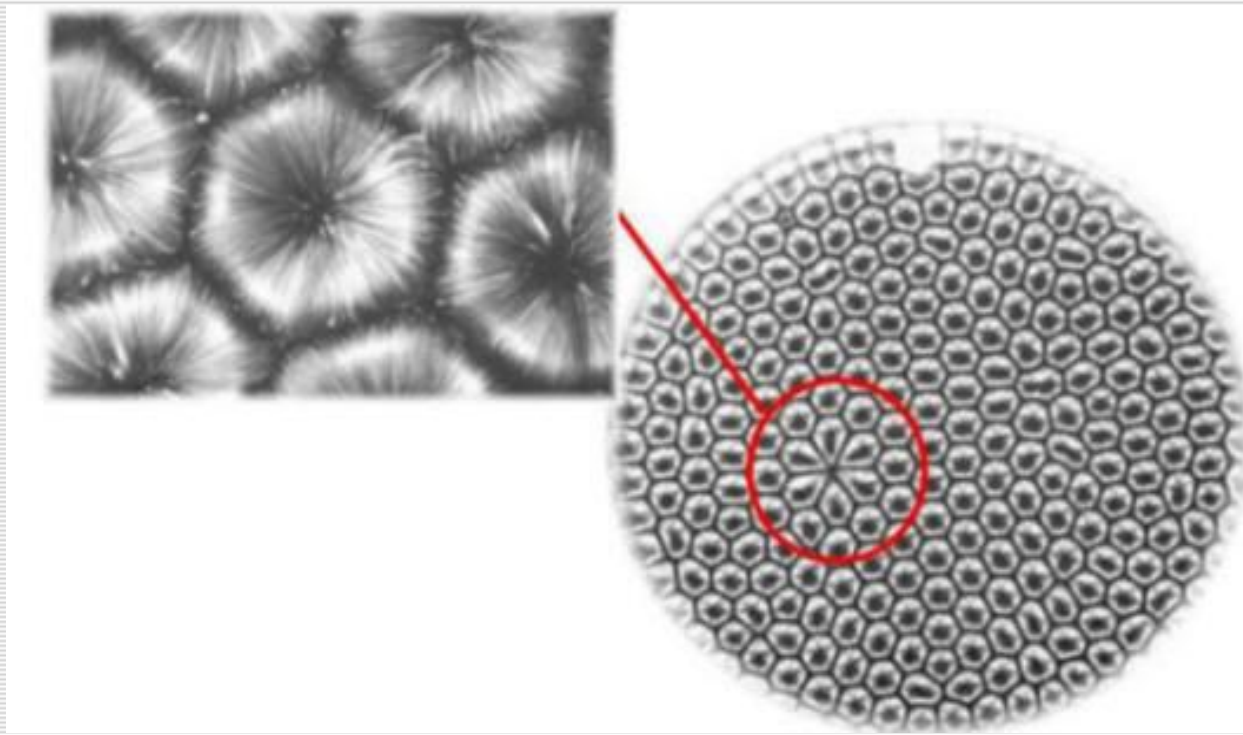


*Le celle di Benard descrivono il moto di un fluido per effetto convettivo quando gli viene fornito calore dal basso.*

*E' l'esempio dell'instaurarsi spontaneo di un ordine in un sistema caotico.*



# *Celle di Benard*





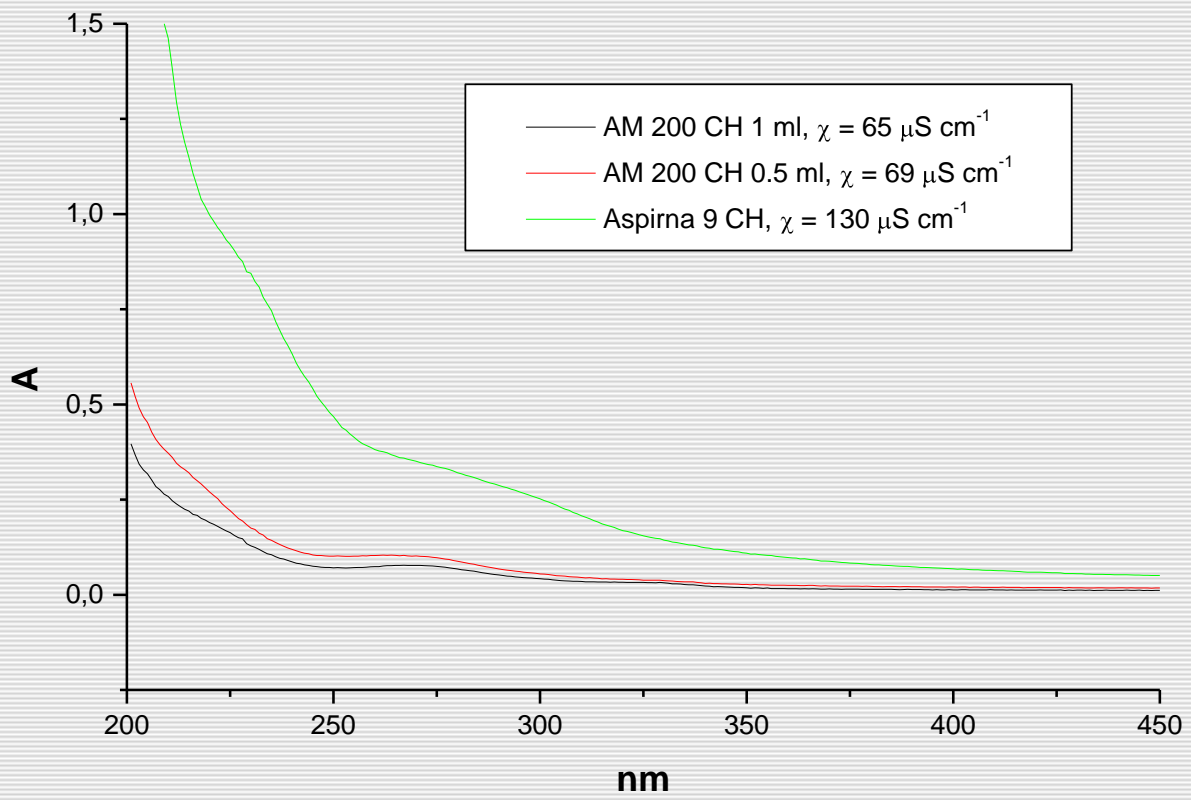


# *Fase Liquida*



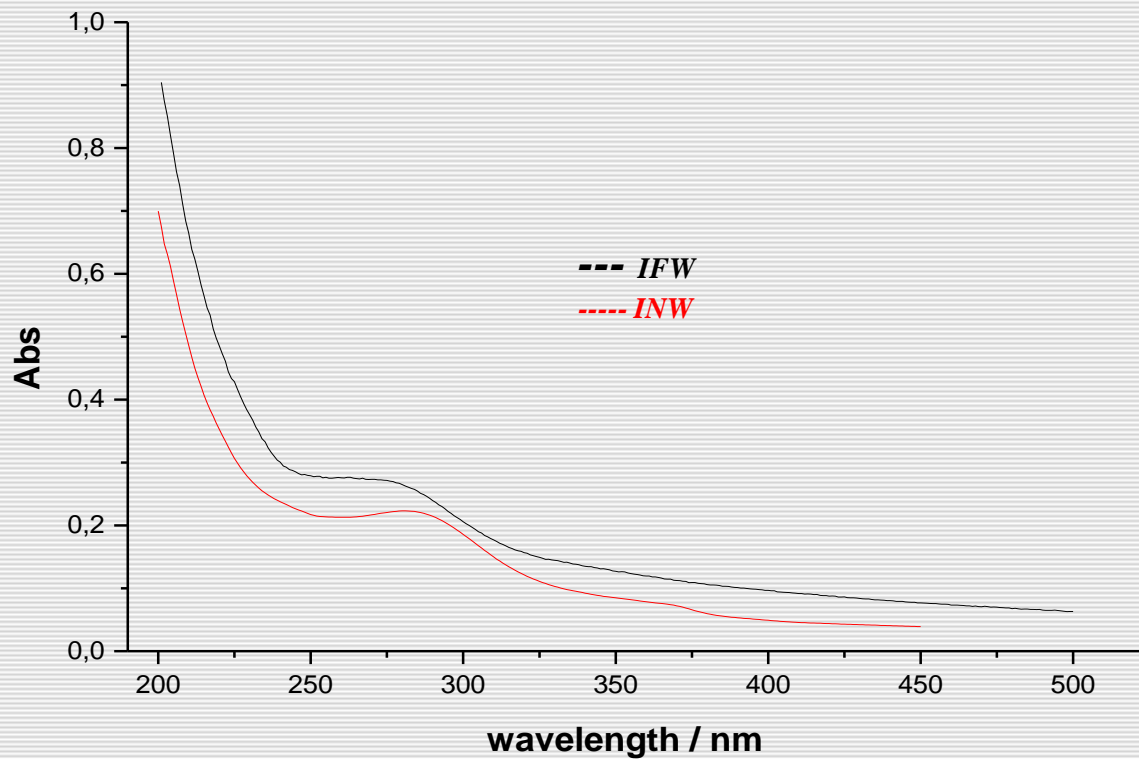
# *UV - Vis Spectra*





*V.Elia, G.Ausanio, F.Gentile, R.Germano, E.Napoli, M.Niccoli- Homeopathy 2014, 103,44-50*





*Elia V, Ausanio G, De Ninno A, Gentile F, Germano R, Napoli E, Niccoli M-Water 5, 2013 15-26*

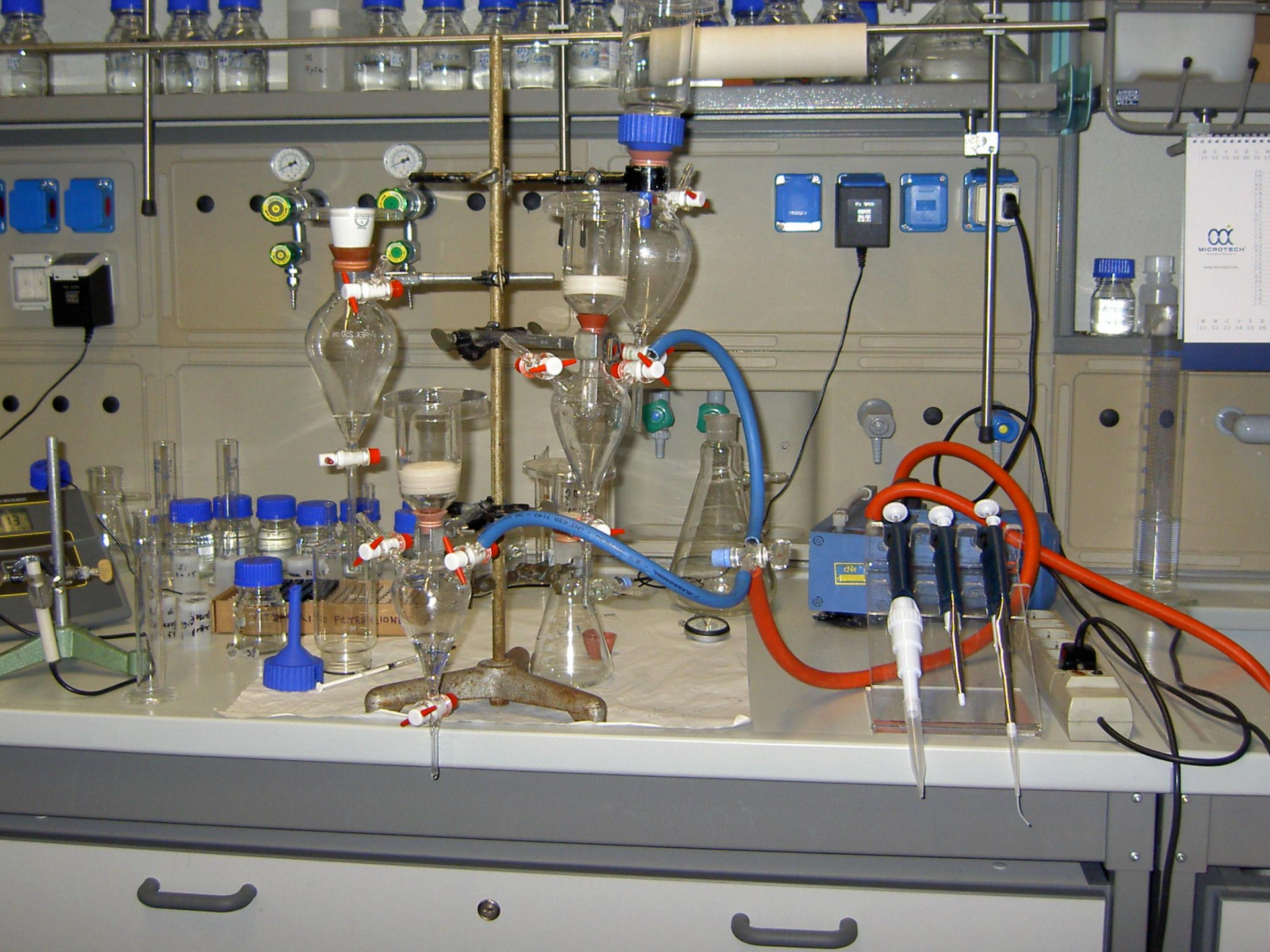
*Elia V, Ausanio G, De Ninno A, Germano R, Napoli E, Niccoli M-Water 5, 2014, 121-130*



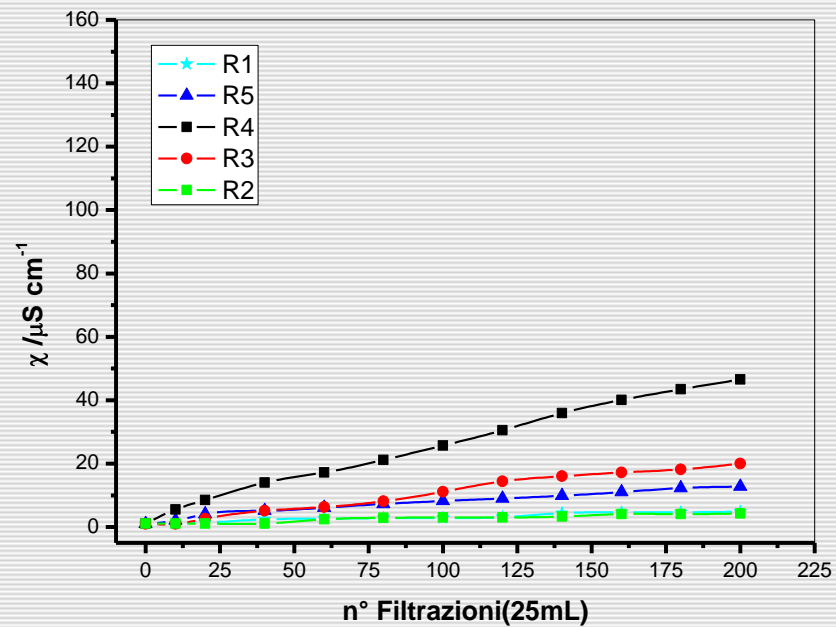
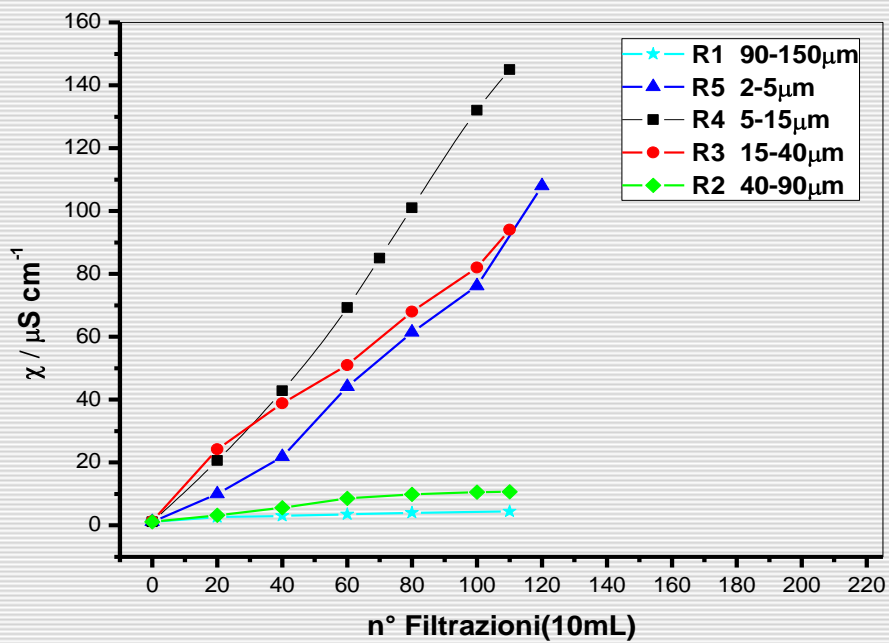


*The Effect of Filtration  
Procedures on the  
Sovramolecular Structure  
of Water*

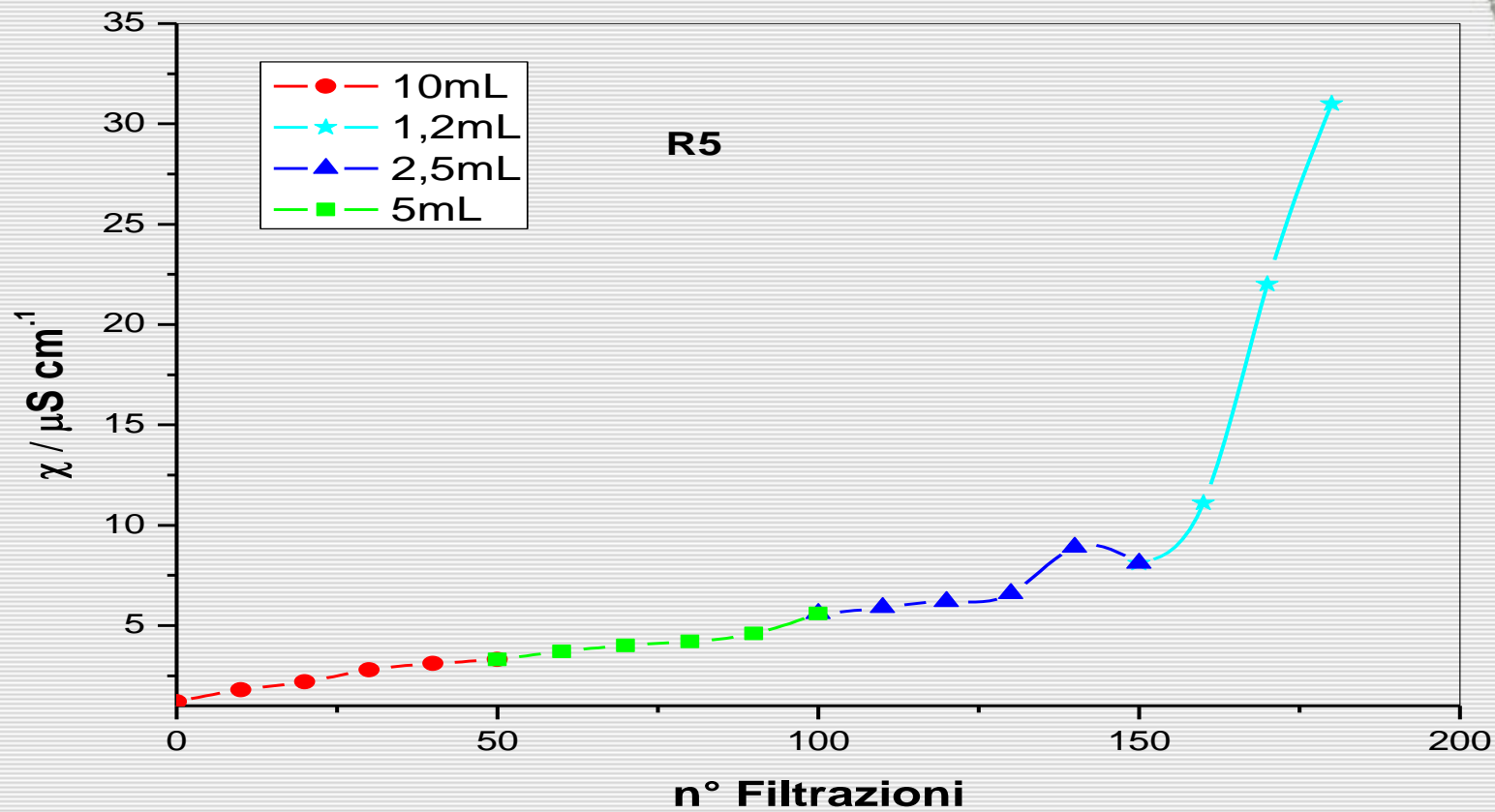








V.Elia, E.Napoli – IC-MAST 2012, Vol. 495

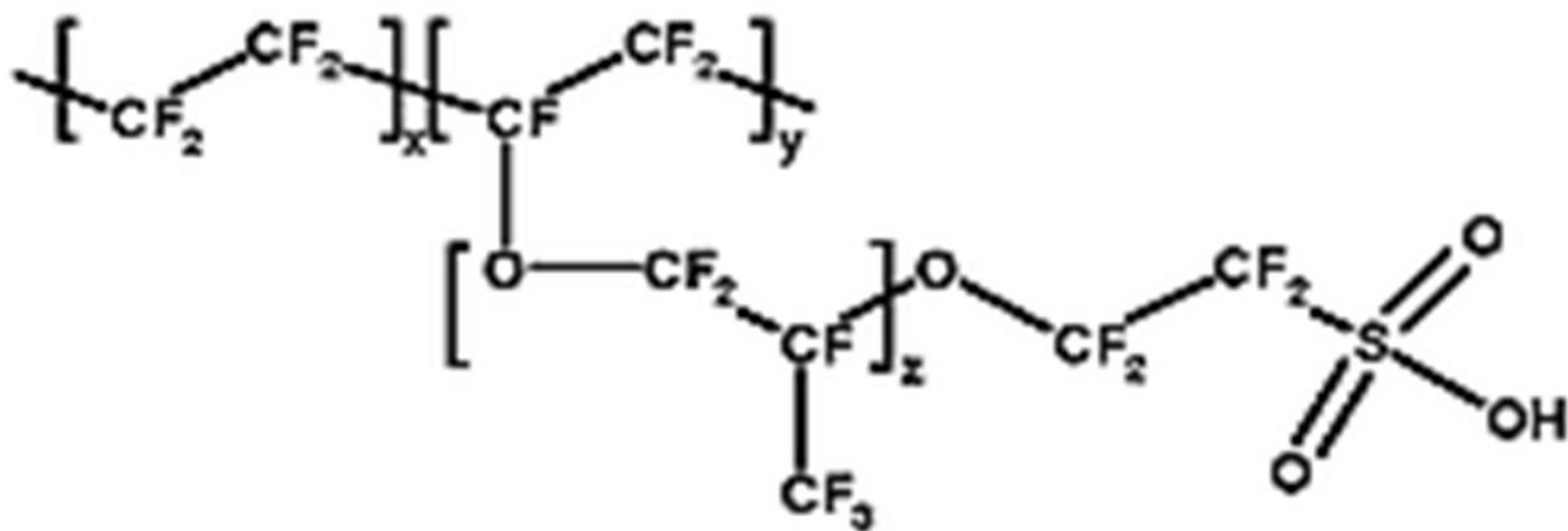


*V.Elia, E.Napoli – IC-MAST 2012, Vol. 495*





*The Effect of Nafion  
on the  
Sovramolecular  
Structure  
of Water*





# pH Sensitive Dye(s)

H<sup>+</sup>

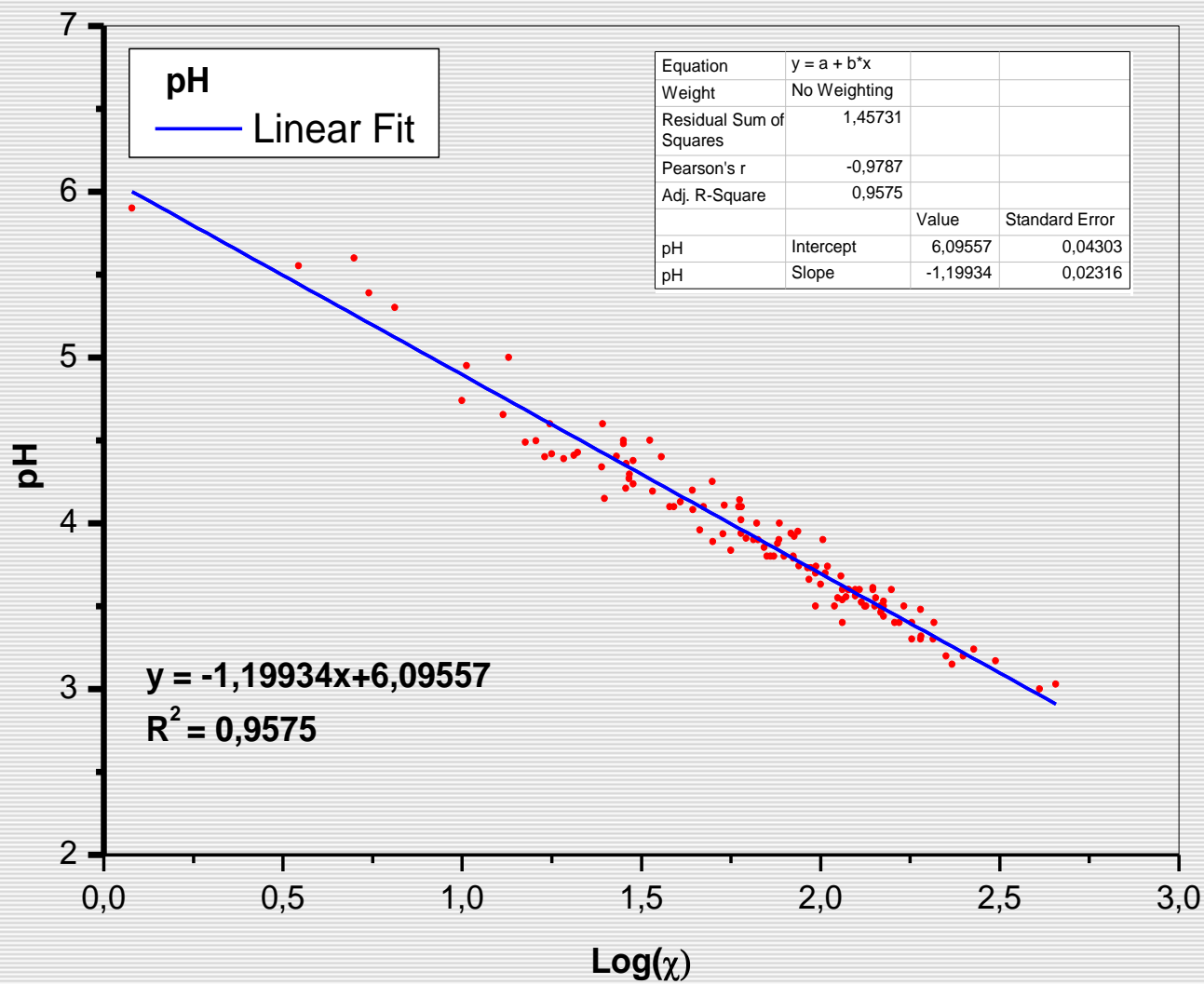
H<sup>+</sup>

H<sup>+</sup>

Nafion

EZ dye excluded

1 mm



*V.Elia, E.Napoli, M.Niccoli-JTAC (2013), Vol.112, N 2*







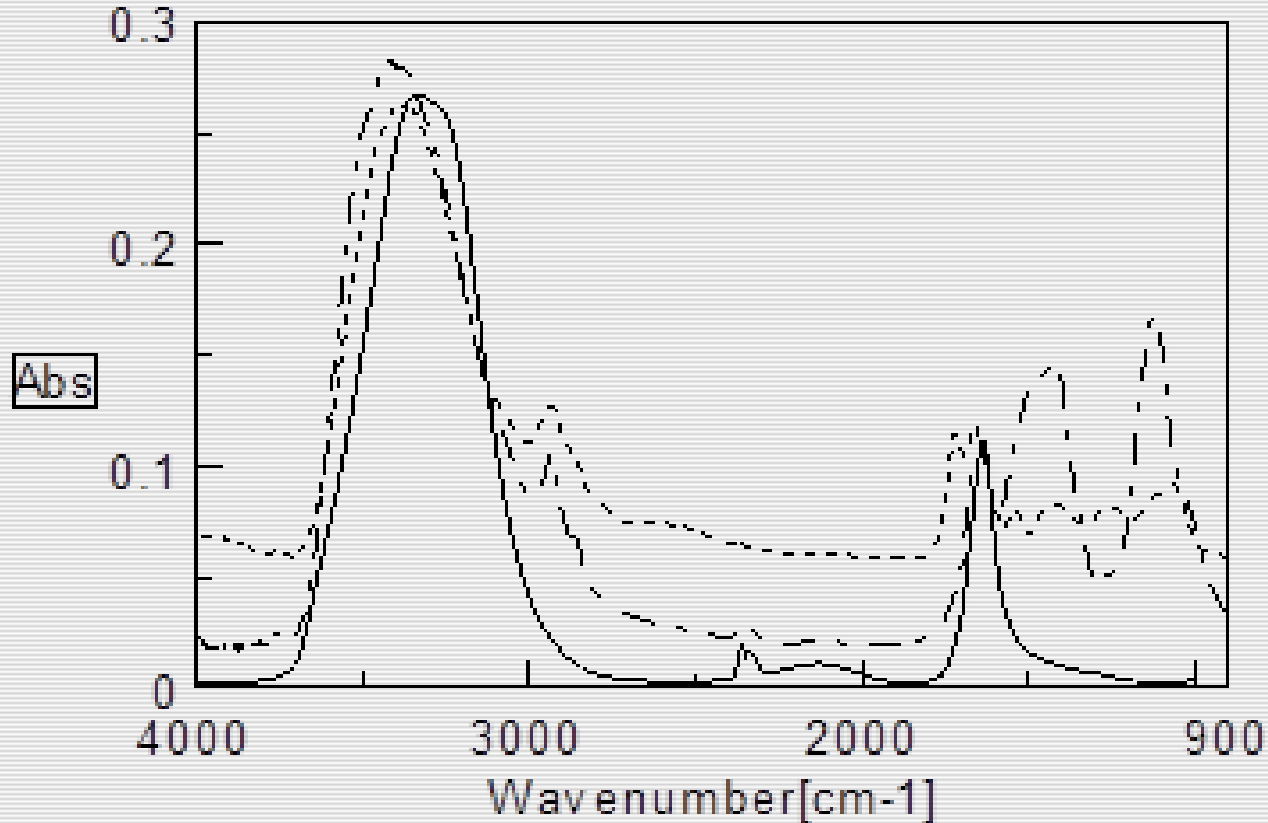
# *IR Solid State Spectroscopy*





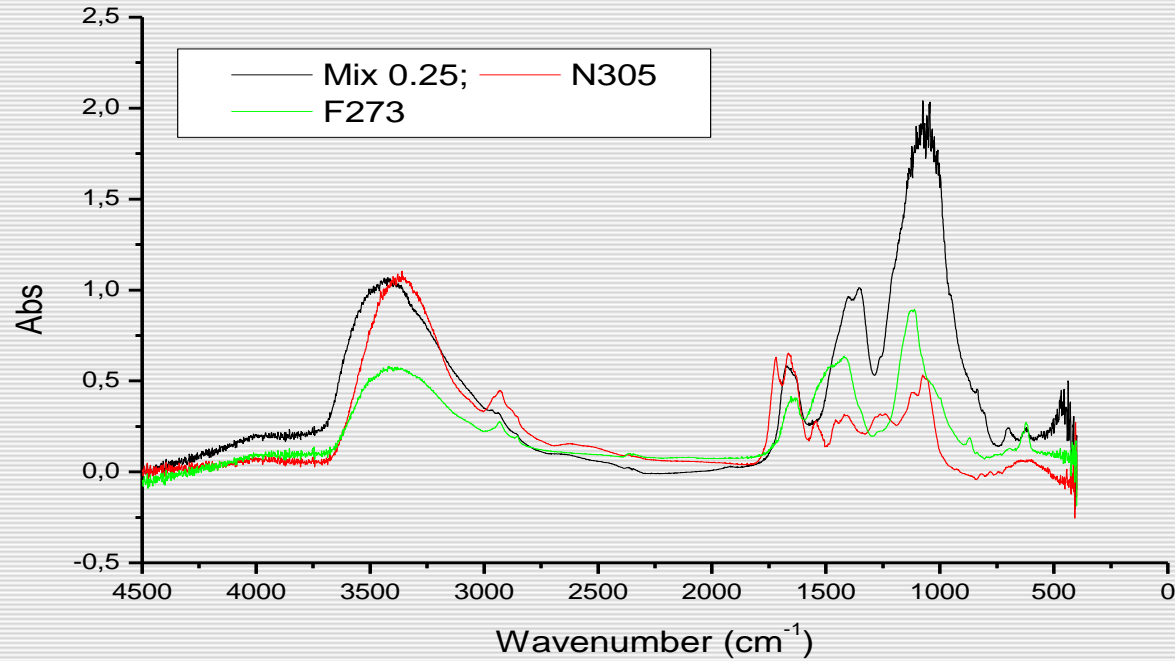
This sup  
light triggered  
and understood in  
processes.

# *IR spectra for solid residues of INW, IFW and water*



*V.Elia, G.Ausanio, A.De Ninno, F.Gentile, R.Germano, E.Napoli, M.Niccoli, 2013, Water 5, 16-26*

# *IR spectra for solid residues for EDS, INW and IFW*



*V.Elia, G.Ausanio, A.De Ninno, F.Gentile, R.Germano, E.Napoli, M.Niccoli, 2013, Water Online*

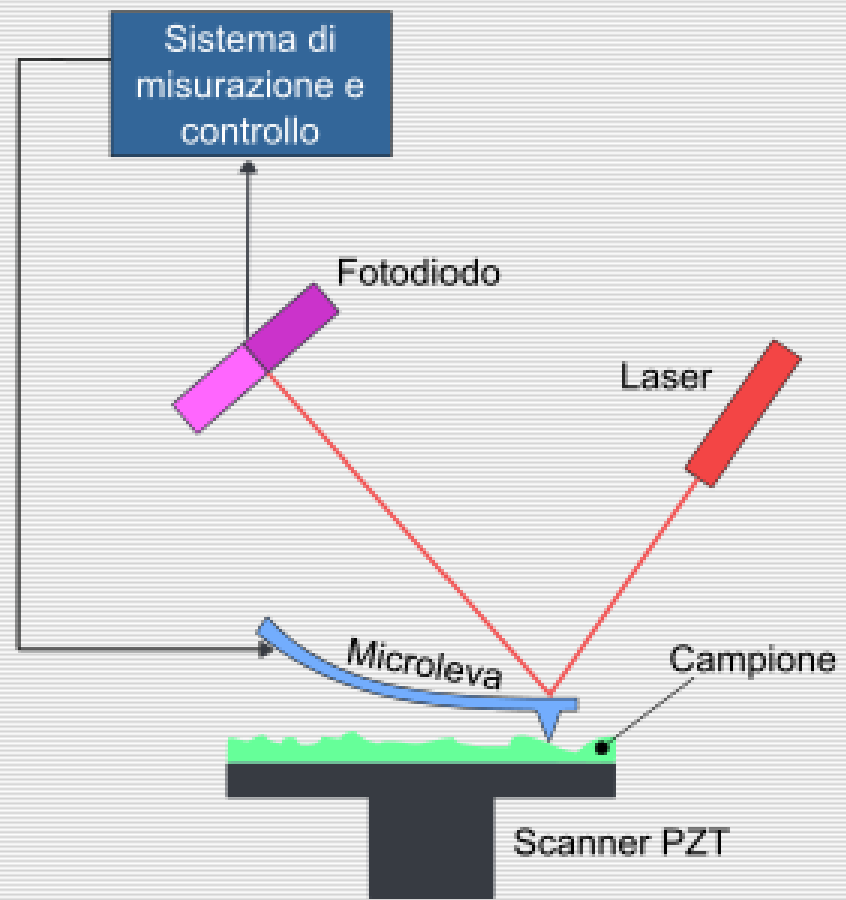




# *Atomic Force Microscopy*

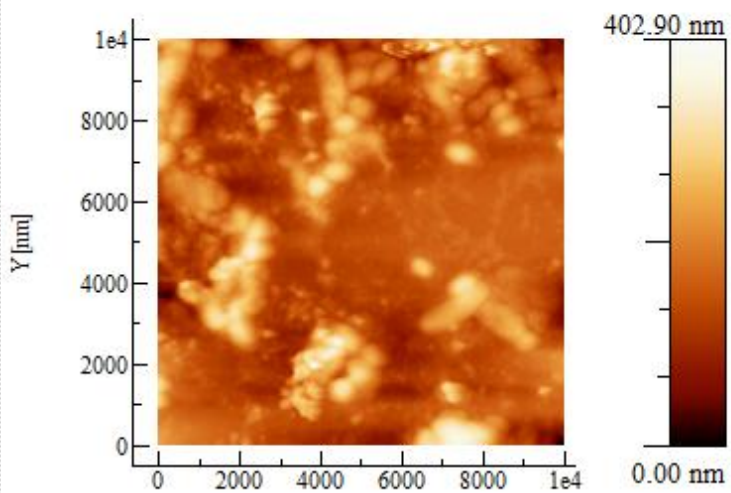
*(AFM)*



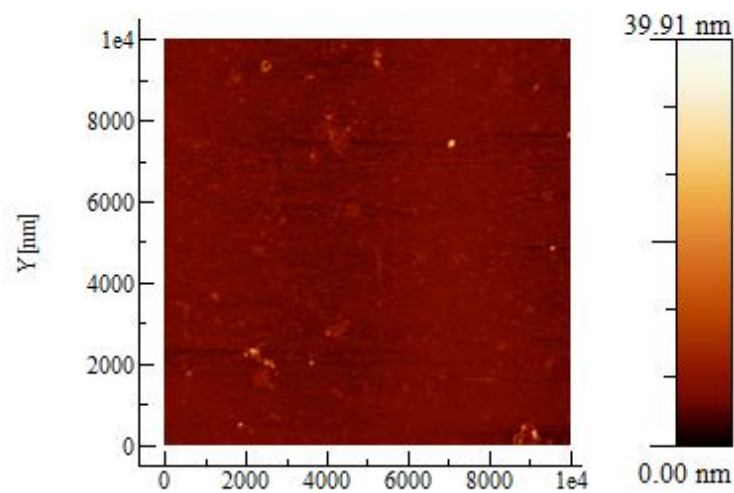




N5 sample



H2O sample



*INW Iteratively Nafionized Water*  
 *$\chi = 321 \mu\text{S}/\text{cm}$  Five Drops*

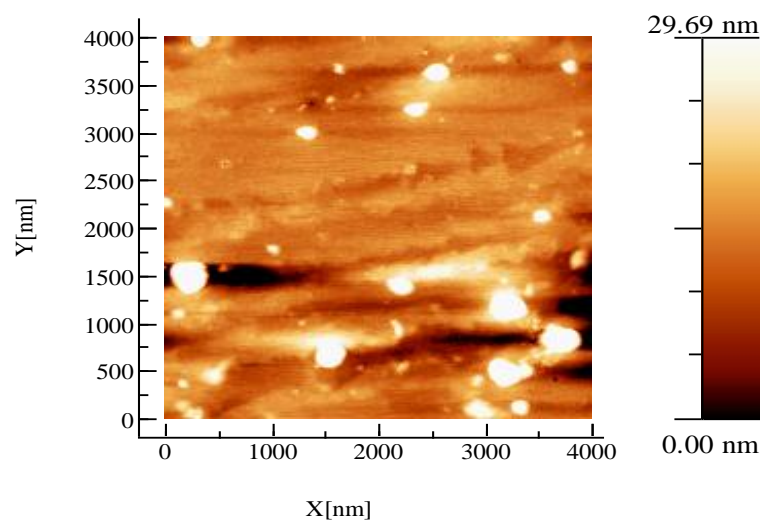
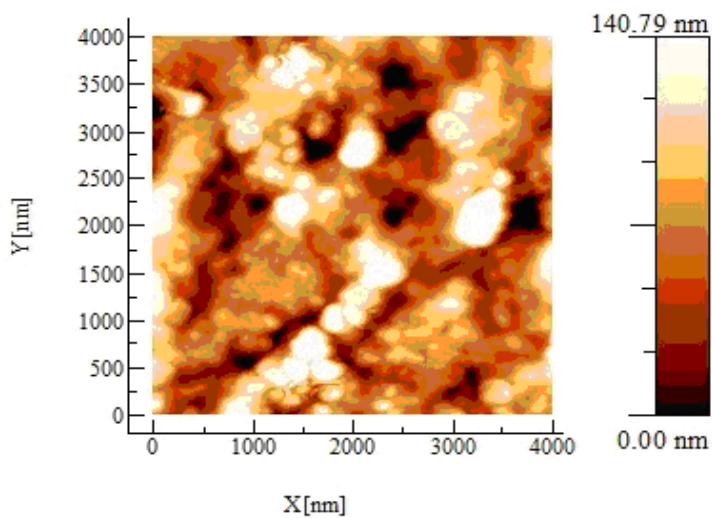
*Control Pure Water*  
*Five Drops*





SAMPLE F273 B5

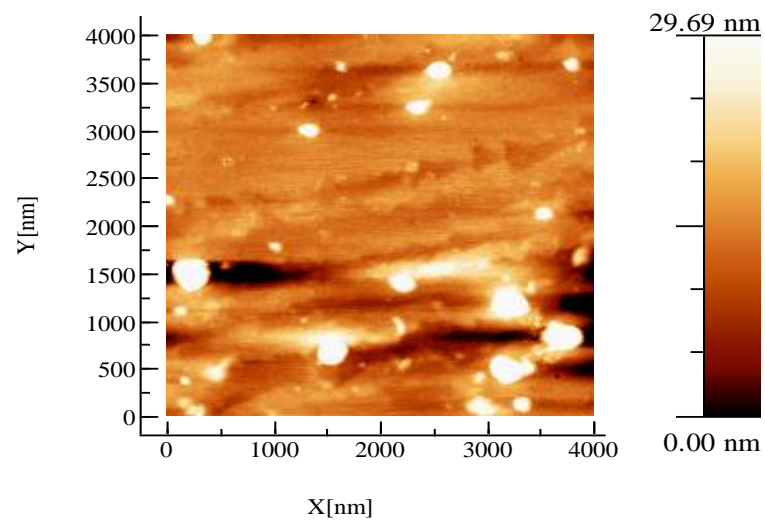
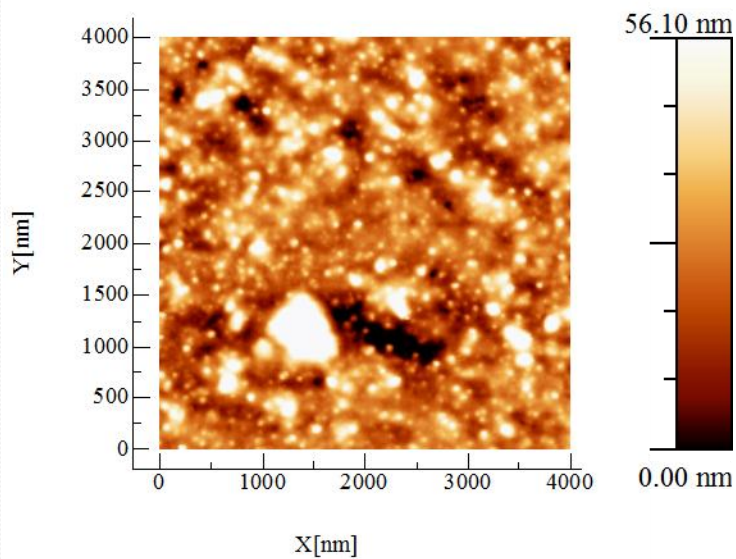
GP 84



*IFW Iteratively Filtered Water  
Five Drops*

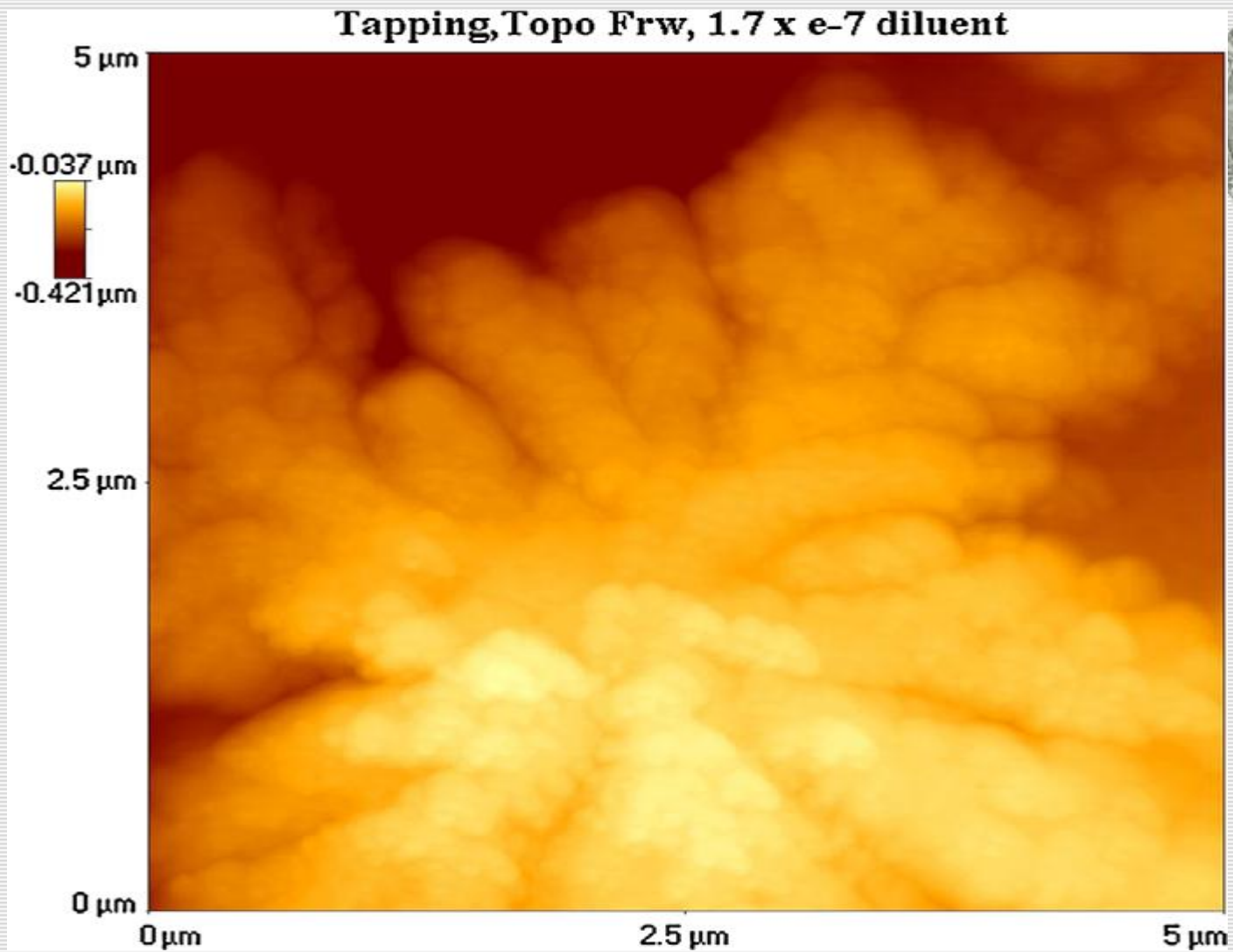
*Control Glass Powder  
Five Drops*





*Arnica Montana 200CH  $\chi = 273 \mu\text{S}/\text{cm}$   
Three Drops*

*Control Glass Powder GP 84  
Three Drops*



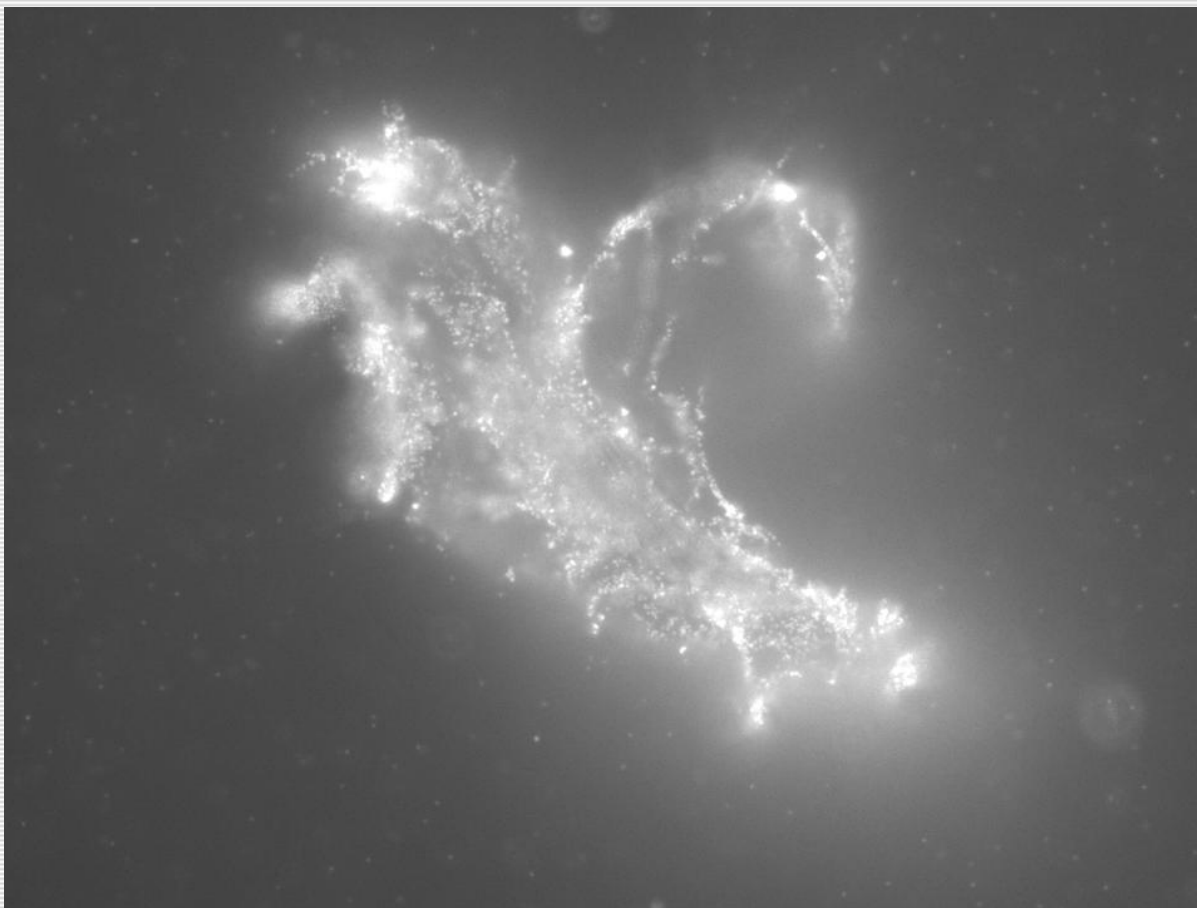
*Physics Letters A – Shui Yin Lo, Xu Geng, David Gann  
Evidence for the existence of stable-water-clusters at room temperature and  
normal pressure, 2009*

*Hundreds Drops*





# *Fluorescence Microscopy*

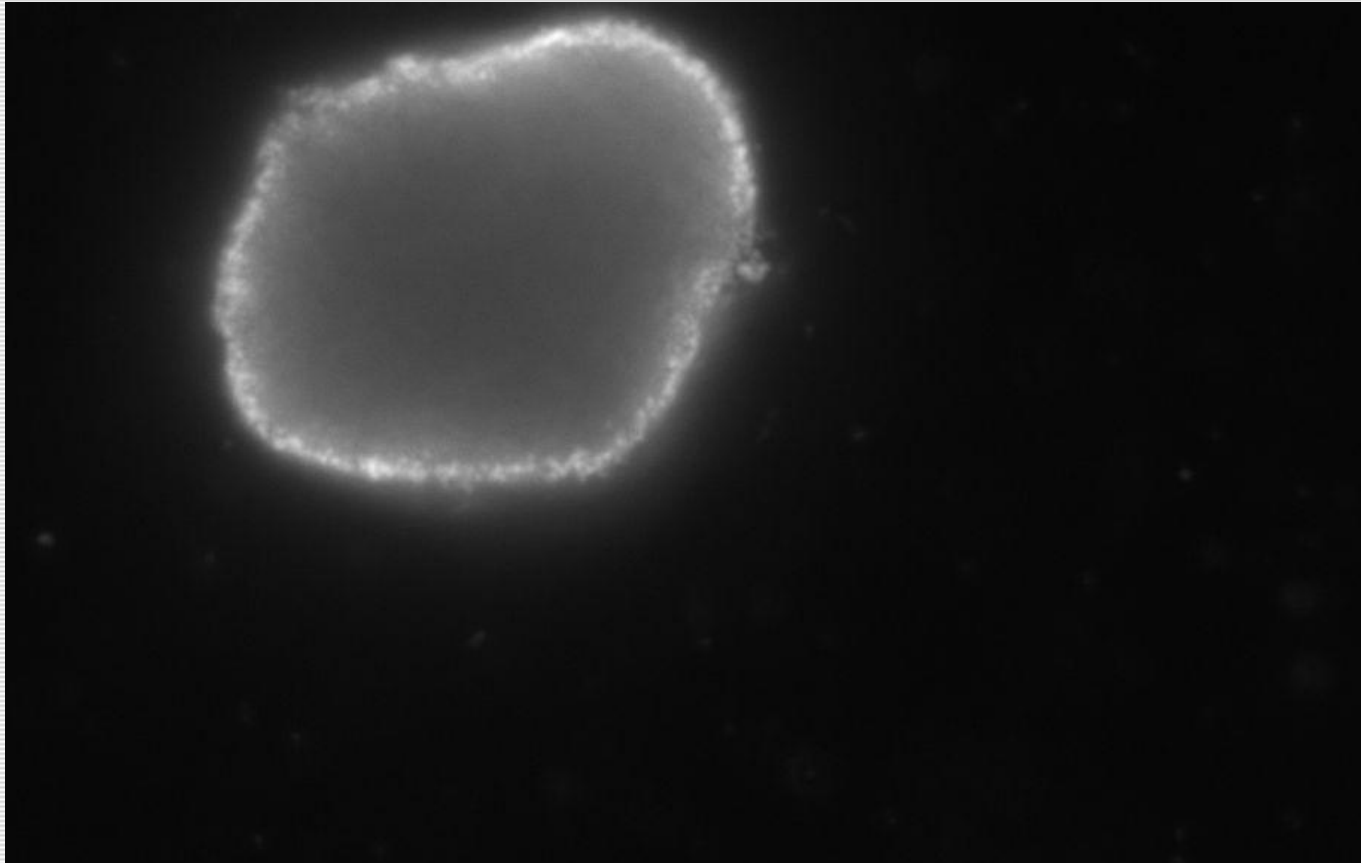


*INW Iteratively Nafionated Water  $\chi = 200 \mu\text{S}/\text{cm}$*

*V.Elia, G.Ausanio, A.De Ninno, F.Gentile, R.Germano, E.Napoli, M.Niccoli, 2013, Water Online*

***Molecular Aggregates  
in the liquid phase can be seen !***

# *Aspirine EDS*

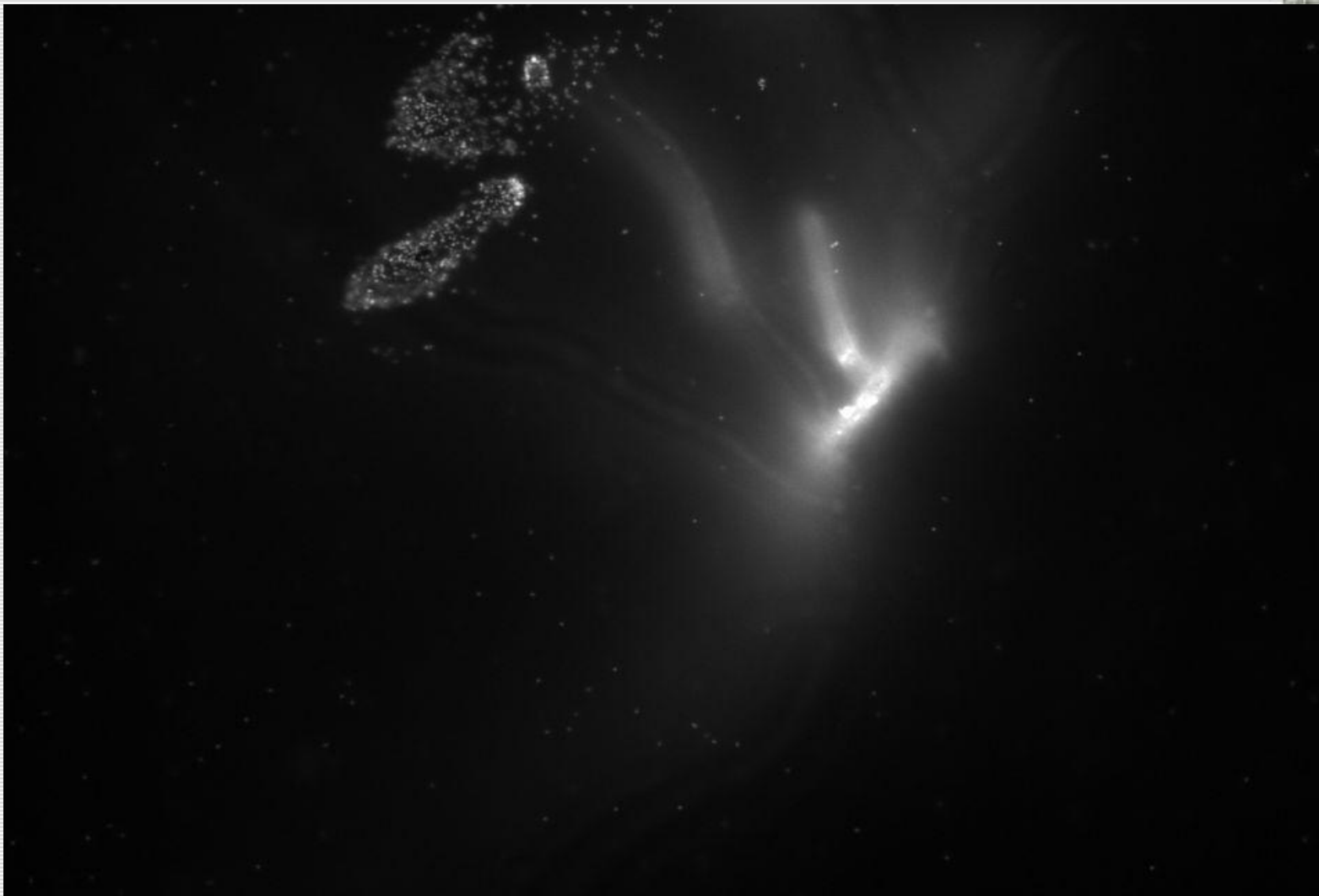


*Aspirine 12 CH  $\chi = 94 \mu\text{S/cm}$*

*V.Elia.G.Ausanio,A.DeNinno,F.Gentile,R.Germano,E.Napoli,M.Niccoli,2013 Homeopathy Online*



# IFW



*Iteratively Filtered Water*  $\chi = 270 \mu\text{S}/\text{cm}$  di Chimica

Dipartimento



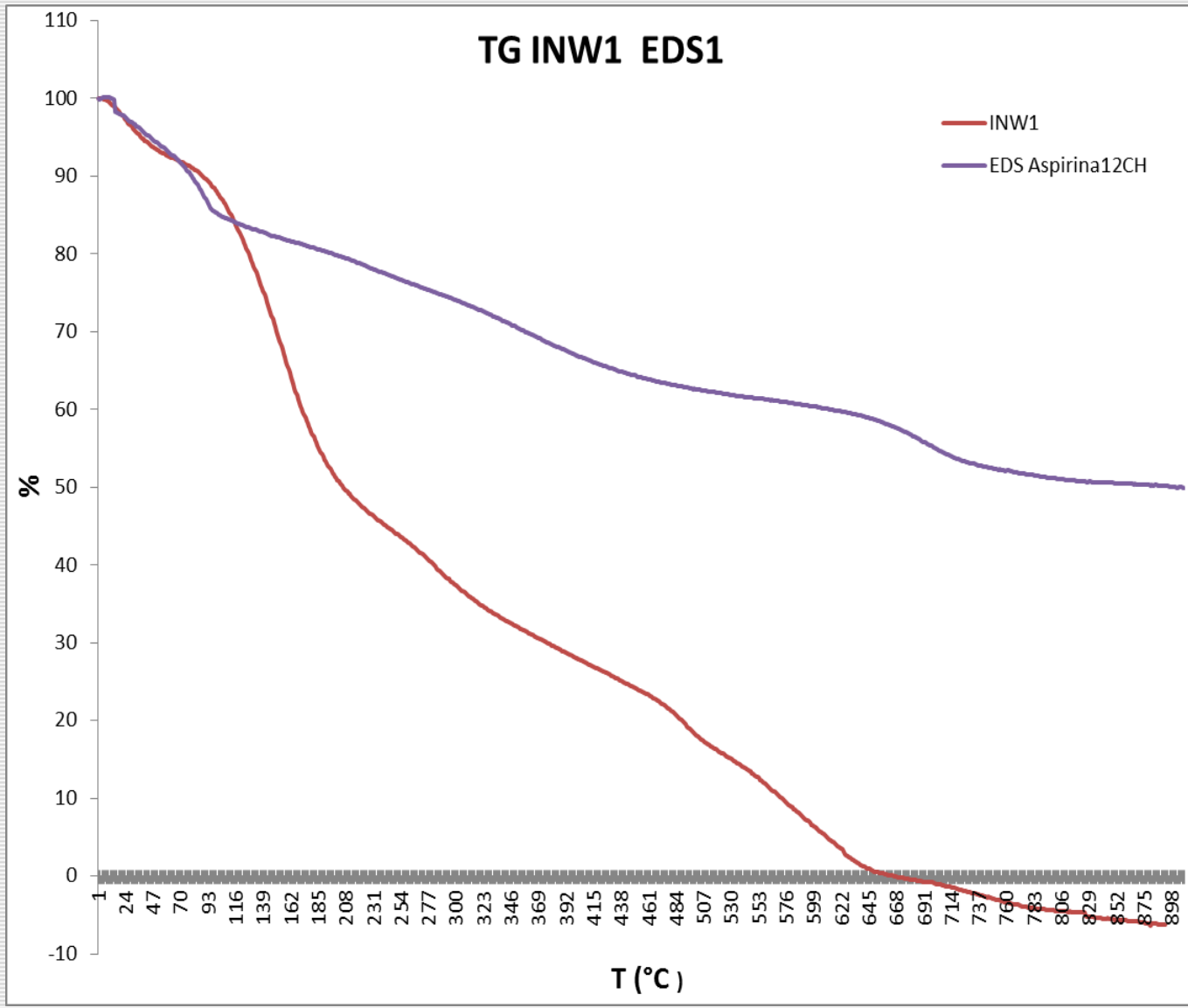


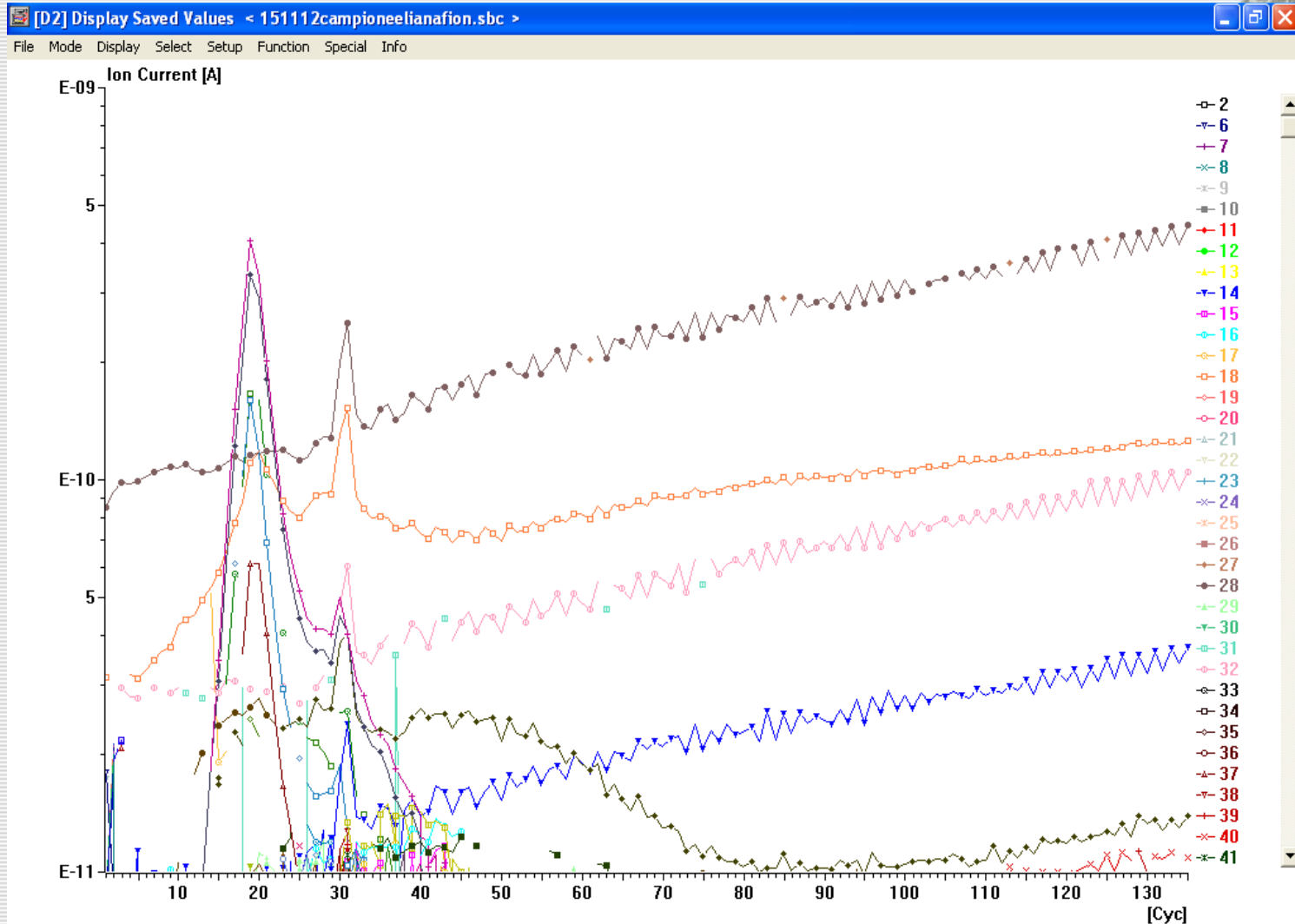


# *Thermogravimetry*



*Thermogravimetry is a method of analysis in which the product is continuous record of changes in the mass of a sample, in a controlled atmosphere and as a function of temperature or time. The result of the analysis is usually expressed with a thermogravimetric curve that shows on the abscissa the temperature or the time and on the ordinate the variation of mass as an absolute value or percentage; this chart is also defined curve of thermal decomposition.*





*Is the abundant element with 18 amu deriving from the thermal decomposition responsible of the total mass loss of the solid?*

## *Conclusions*



*The abundant substance  
from the thermal decomposition  
with 18 atomic mass units  
accounts for the total mass loss  
of the solid.*

*Is it a new state of water ?*

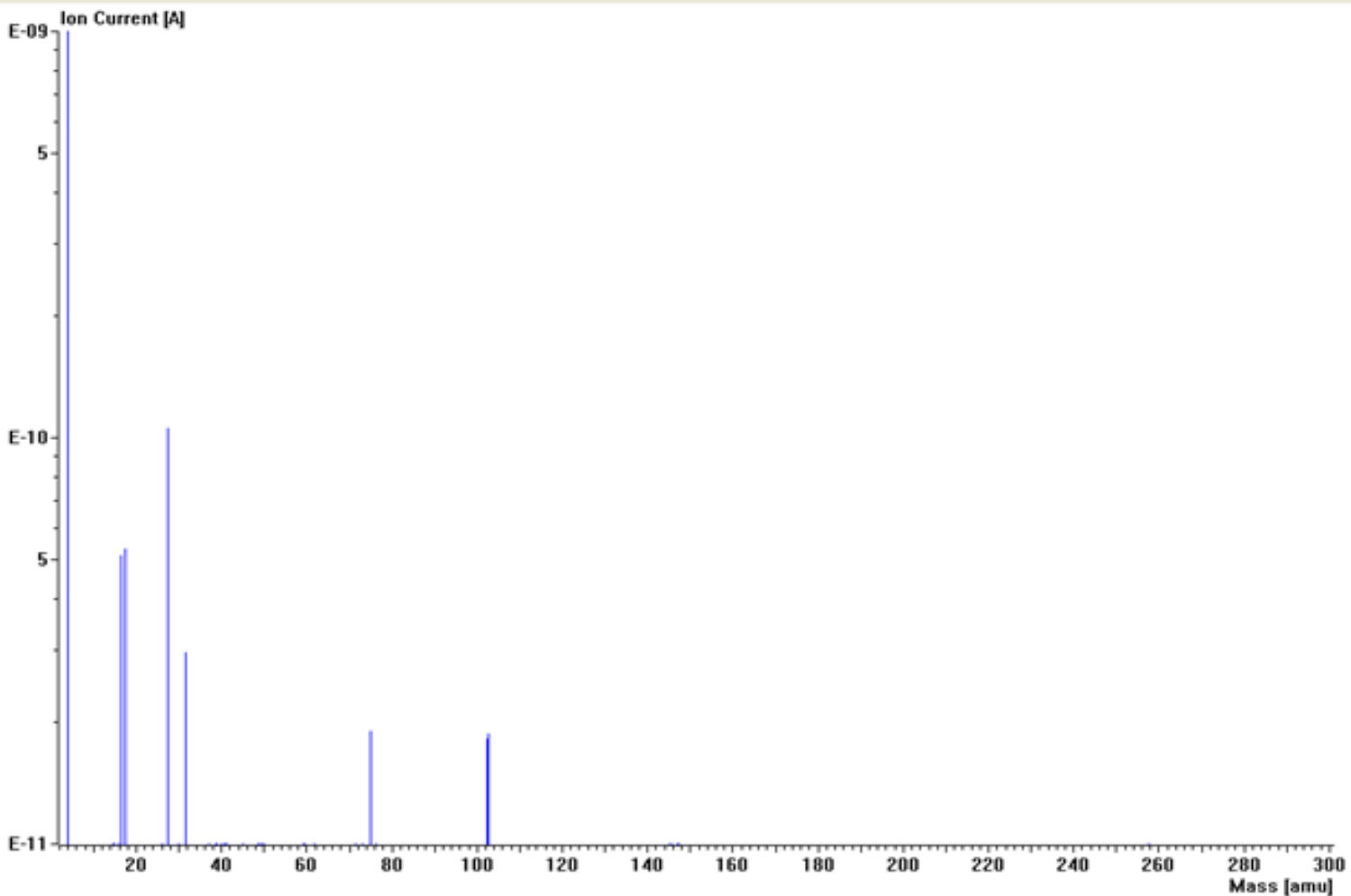


*Thank you  
for your attention*



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