

STUDY OF CHEMICAL-PHYSICAL SLURRIES AND DOUGHS PROPERTIES AND DEVELOPMENT OF ADVANCED CONTROL TECHNIQUES/METHODOLOGIES

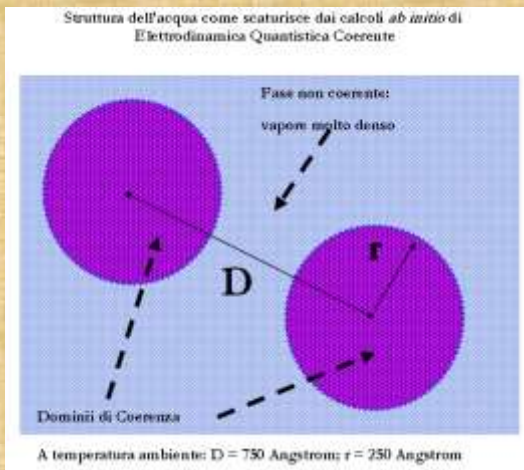


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PROMETE has recently identified the chemical-physical foundation of instability of the productive characteristics of the slurries that would have been even inconceivable until a few years ago for lack of knowledge both theoretical and experimental.



Since many years it has been established (both experimentally and theoretically) that liquid water is a biphasic system, and that if it undergoes some types of purely physical treatments, albeit at low energy, its dynamics change, giving rise to nanometric aggregates in weight quantities (which change many chemical-physical parameters of water, such as pH and electrical conductivity, mixing heat, density, IR absorbance, etc ...).



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Such nanometric aggregates, having a changed electronic structure compared to the free molecule, as is well known to happen for nanometric structures, present the characteristic (of very recent experimental acquisition), at first glance unexpected, to remain in the solid state at ordinary temperatures and pressures, once removed, by evaporation (or freeze-drying), the remaining liquid water component ("bulk water").



Evident weighty aspect of the solid residues: about ten milligrams, coming from the lyophilization of only 250 ml of iteratively naphionated water (INW).

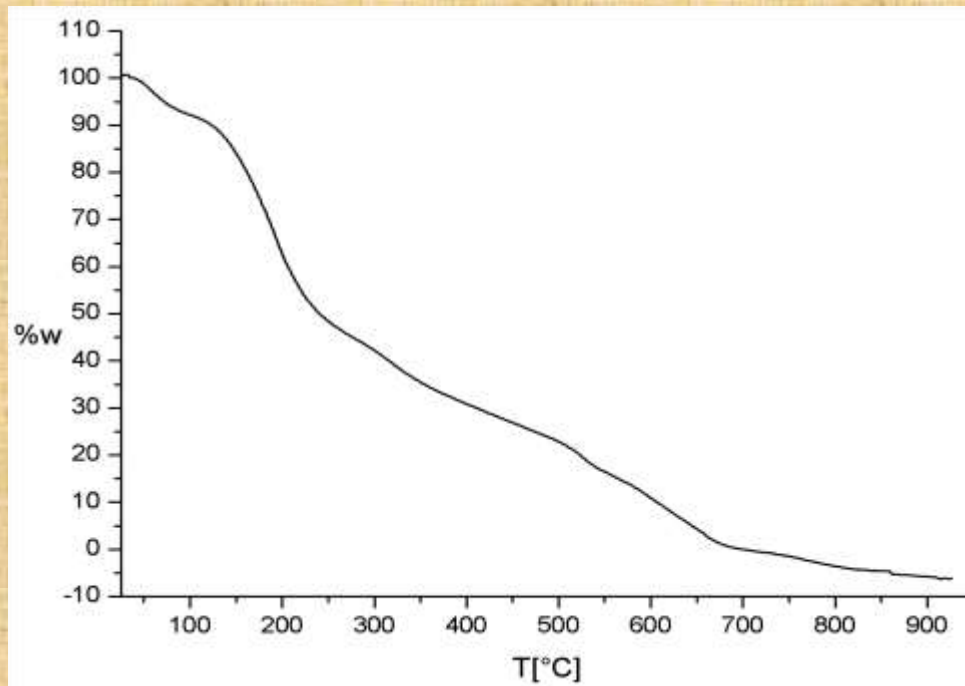
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Indeed, as we highlighted by Thermogravimetric techniques (TGA), a non-negligible fraction of these aggregates remains in the solid state up to temperatures of several hundred degrees.

These aggregates, therefore, are present within the mixtures, and
- in addition to disturbing the chemical and physical characteristics
of the mixtures in the liquid phase -
their wide-ranging solid structure (amorphous, but fractal) ...



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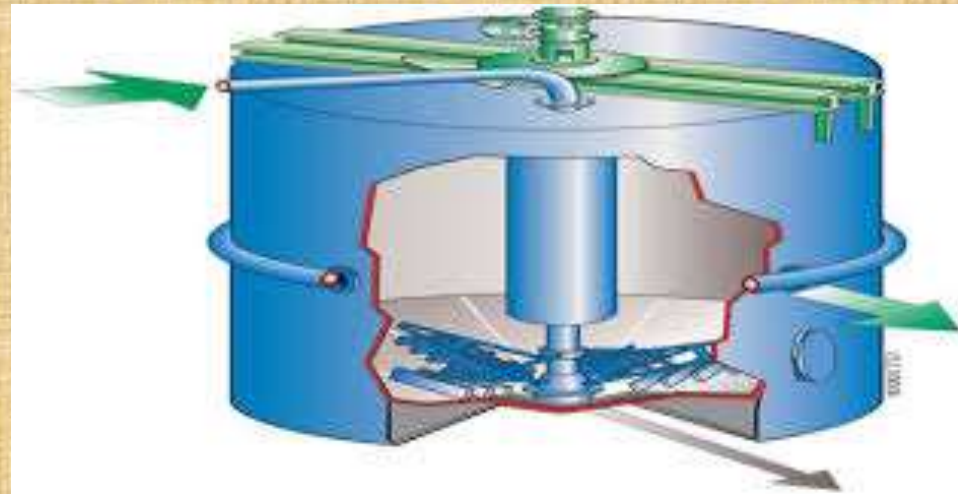
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... is then responsible for the different final grain of the finished product (mechanical properties), as well as its thermal properties (drying times) also in the solid state, similarly if it were a "added" chemical species.

This happens initially in the liquid phase, in a manner dependent on external parameters, some known and others to be identified, some probably also with a periodic / "seasonal" time dependence, as already verified in other contexts for this type of dissipative structures.

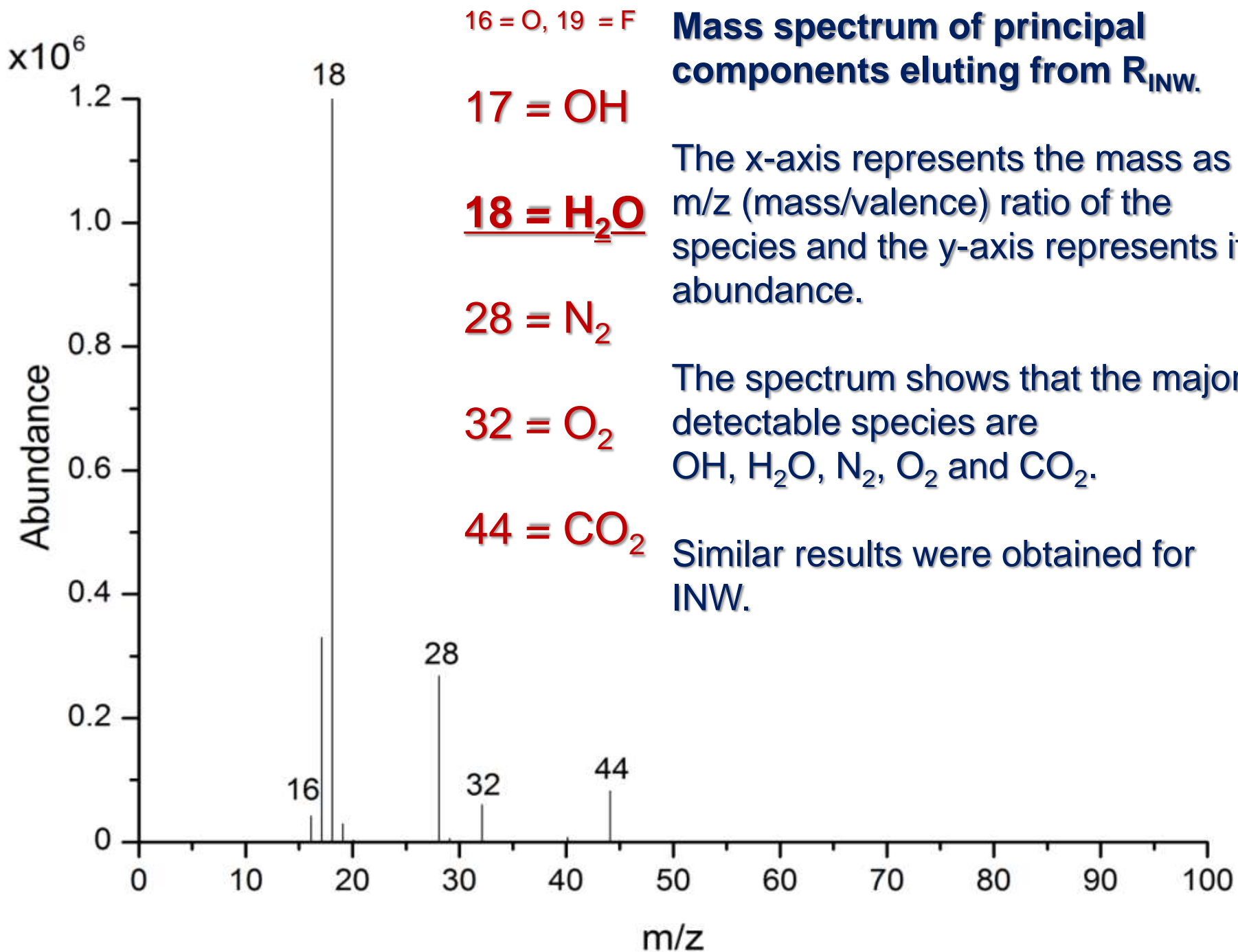
It is clear that currently the methods that aim to study the stability of the slurries and doughs to optimize their performances suffer for a series of unexpressed problems; in practice, there is a large shaded area where "no one knows not to know".

Normally, the consequences of this "shadow area" are somehow attributed to an intrinsic instability of the phenomenon due to the fact that too many parameters have to be taken into account.



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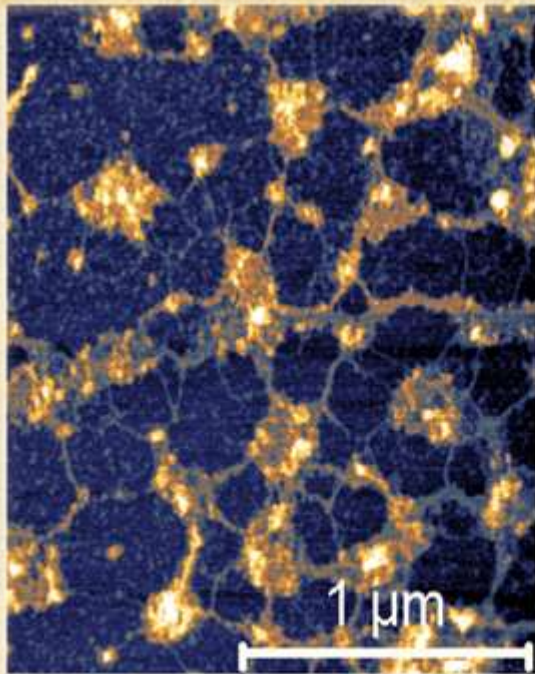
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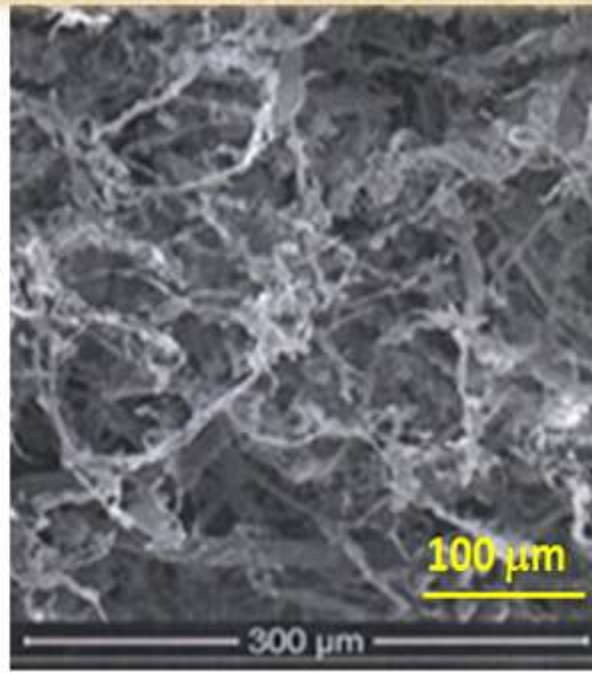
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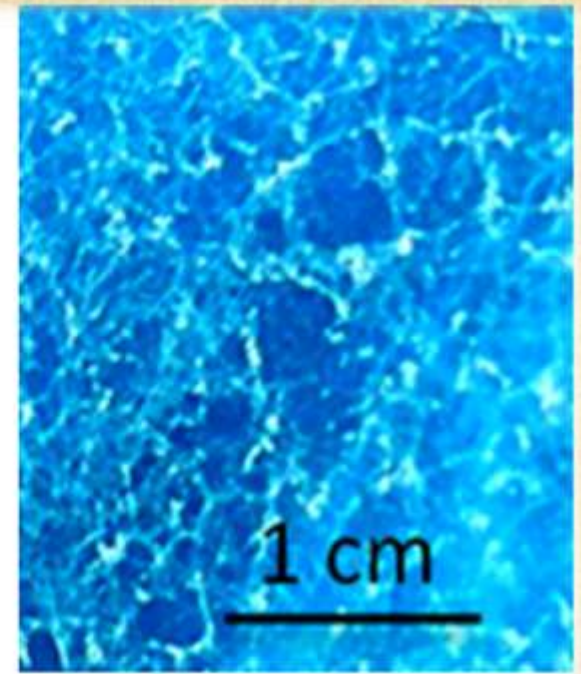
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10^{-6} m



10^{-4} m

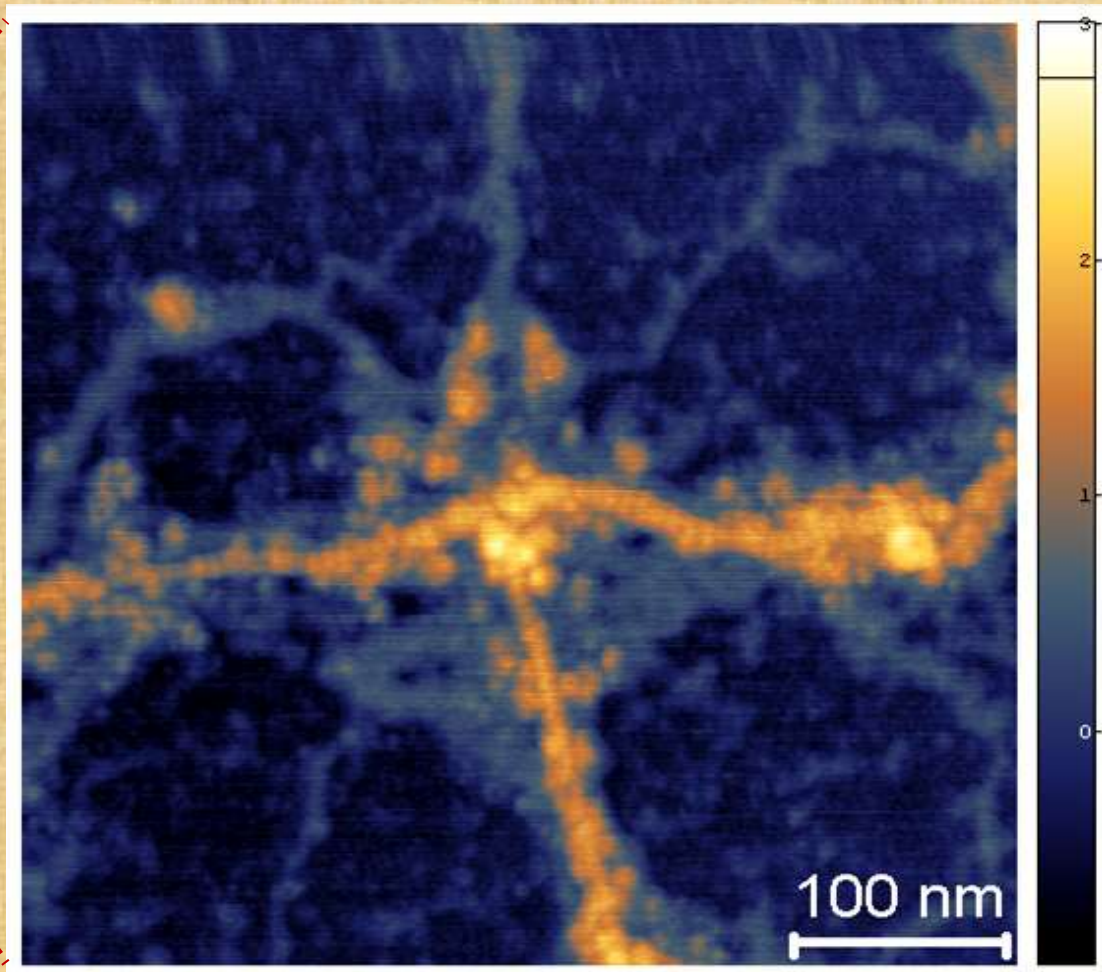
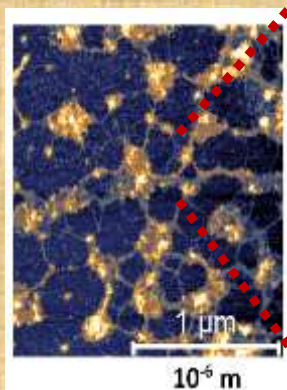


10^{-2} m

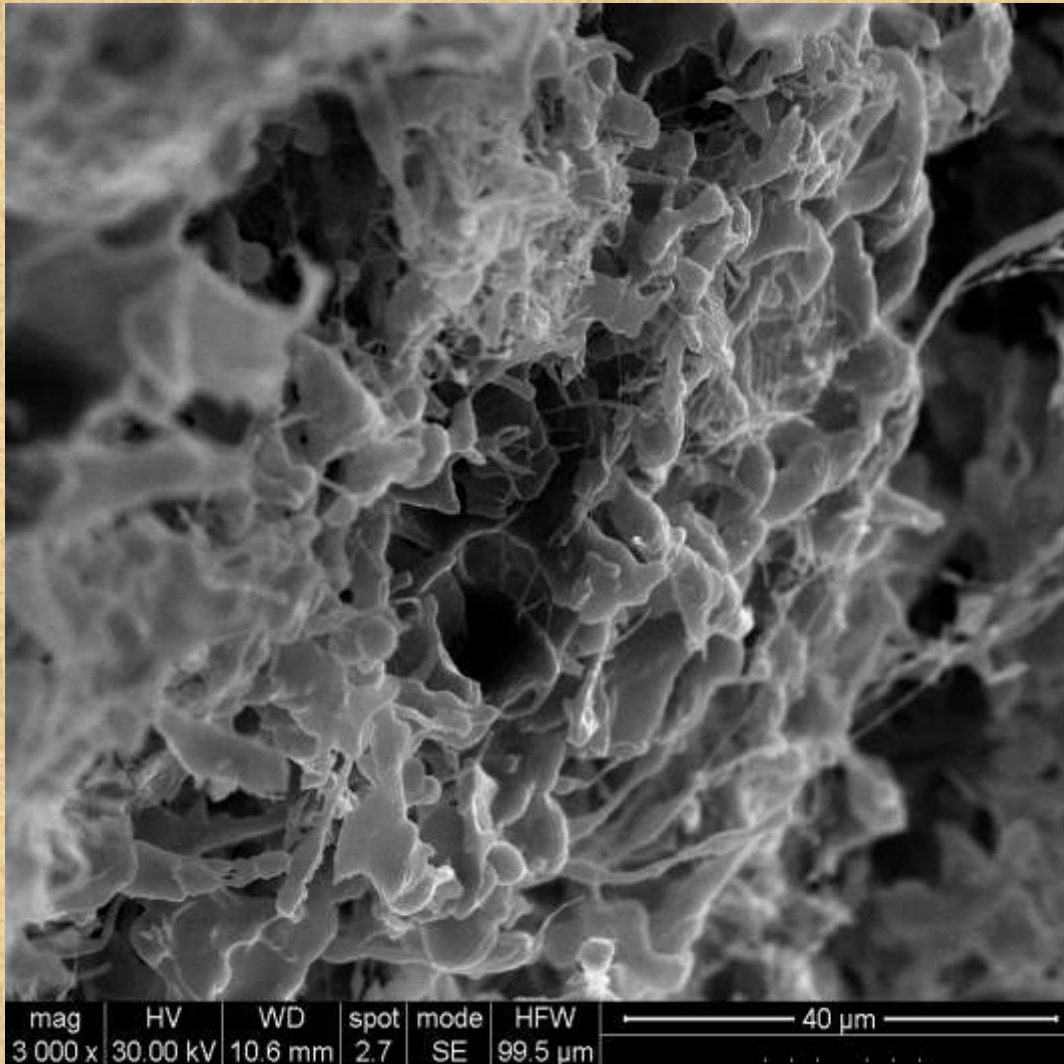
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Bibliography

- V. Elia, R. Oliva, E. Napoli, R. Germano, G. Pinto, L. Lista, M. Niccoli, D. Toso, G. Vitiello, M. Trifuoggi, A. Giarra, T. A. Yinnon, Experimental evidences of physicochemical changes in water by iterative contact with a natural hydrophilic polymer Cellulose: a comparison with the synthetic hydrophilic polymer Nafion, *Journal of Molecular Liquids*, 268, 598-609 (2018)
- C. Verzegnassi, R. Germano, P. Kurian, Quantum field theory treatment of magnetic effects on a system of free electrons, *Journal of Magnetism and Magnetic Materials*, 449, 482-484 (2018)
- V. Elia, T.A. Yinnon, R. Oliva, E. Napoli, R. Germano, F. Bobba, A. Amoresano, DNA and the chiral water superstructure, *Journal of Molecular Liquids*, 248, 1028-1029 (2017)
- V. Elia, T.A. Yinnon, R. Oliva, E. Napoli, R. Germano, F. Bobba, A. Amoresano, Chiral micron-sized H₂O aggregates in water: Circular dichroism of supramolecular H₂O architectures created by perturbing pure water, *WATER*, 8, 1-29 (2017)
- T.A. Yinnon, V. Elia, E. Napoli, R. Germano, Z-Q Liu, Water ordering induced by interfaces: an experimental and theoretical study, *WATER*, 7, 96-128 (2016)
- R. Germano, Water's Permanent Dissipative Structures Quantum Origin And Life, *Electromagnetic Biology and Medicine*, 34, 2, 133-137 (2015)
- V. Elia, R. Germano, E. Napoli, Permanent Dissipative Structures in Water: The Matrix of Life? Experimental Evidences and their Quantum Origin, *Current Topics in Medicinal Chemistry*, 15, 6, 559-571 (2015)
- A. Capolupo, E. Del Giudice, V. Elia, R. Germano, E. Napoli, M. Niccoli, A. Tedeschi, G. Vitiello, Self-similarity properties of nafionized and filtered water and deformed coherent states, *Int. J. Mod. Phys. B*, 28, 3 (2014)
- V. Elia, G. Ausanio, A. De Ninno, F. Gentile, R. Germano, E. Napoli, M. Niccoli, Experimental Evidences of Stable Water Nanostructures At Standard Pressure And Temperature Obtained by Iterative Filtration, *WATER*, 5, 121-130 (2014)
- V. Elia, G. Ausanio, A. De Ninno, F. Gentile, R. Germano, E. Napoli, M. Niccoli, Experimental evidence of stable aggregates of water at room temperature and normal pressure after iterative contact with Nafion polymer membrane, *WATER*, 5, 16-26 (2013)
- R. Germano, E. Del Giudice, A. De Ninno, V. Elia, C. Hison, E. Napoli, V. Tontodonato, F. P. Tuccinardi, G. Vitiello, Oxhydroelectric Effect in bi-distilled water, *Key Engineering Materials*, 543, 455-459 (2013).
- R. Germano, *AQUA*, Bibliopolis (2007)

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A POSSIBLE CHEMICAL-PHYSICAL FOUNDATION FOR THE INSTABILITY OF THE PRODUCTIVE
CHARACTERISTICS OF THE PRODUCTS COMING FROM SLURRIES AND DOUGHS

IT COULD BE EMERGING FROM THE FOLLOWING SCENARIO:

1. The evaporation of the bulk water would leave solid aggregates of water in the mixtures, whose shape and size would be responsible for the final granularity of the product, as well as its local mechanical, thermal and electrical properties even in the solid state, similarly if it were a chemical species.
2. This would occur in a manner dependent on external parameters to be identified, some probably with a "seasonal" time dependence.
3. The possible effect also on the final product could be due precisely to the verified extraordinary stability of these aggregates in the solid phase.

The logo for 'promete' features the word in a lowercase, sans-serif font. The letter 'o' is replaced by a red circle with a white dot in the center, resembling an eye or a target.

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1. The evaporation of bulk water would leave aggregates of water in the solid state inside the mixtures, whose shape and size would be responsible for the final granularity of the dry product, as well as its local mechanical, thermal and electrical properties, even in the solid state, such as if it were an added chemical species.

Our experimental experience on different systems has shown that from **about 250 ml of pure water suitably treated with purely physical methods**, in the specific repeated exposure to strongly hydrophilic surfaces, **a few grams of solid material** can be obtained after a limited number of iterations (Xerosydrile), which corresponds to about **4 kg per mc of water.**

2% of the solid of the dry product could consist of Xerosydrile

→ **Eg: for 5Kg of product → 100g of Xerosydrile?!**

→ **BUT, in some% it could be A BENEFIT for the final characteristics of the dry product.**

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2. This would occur in a manner dependent on external parameters to be identified, some probably with a "seasonal" time dependence.

BUT, now we surely know that

→ irradiation of specific IR frequencies

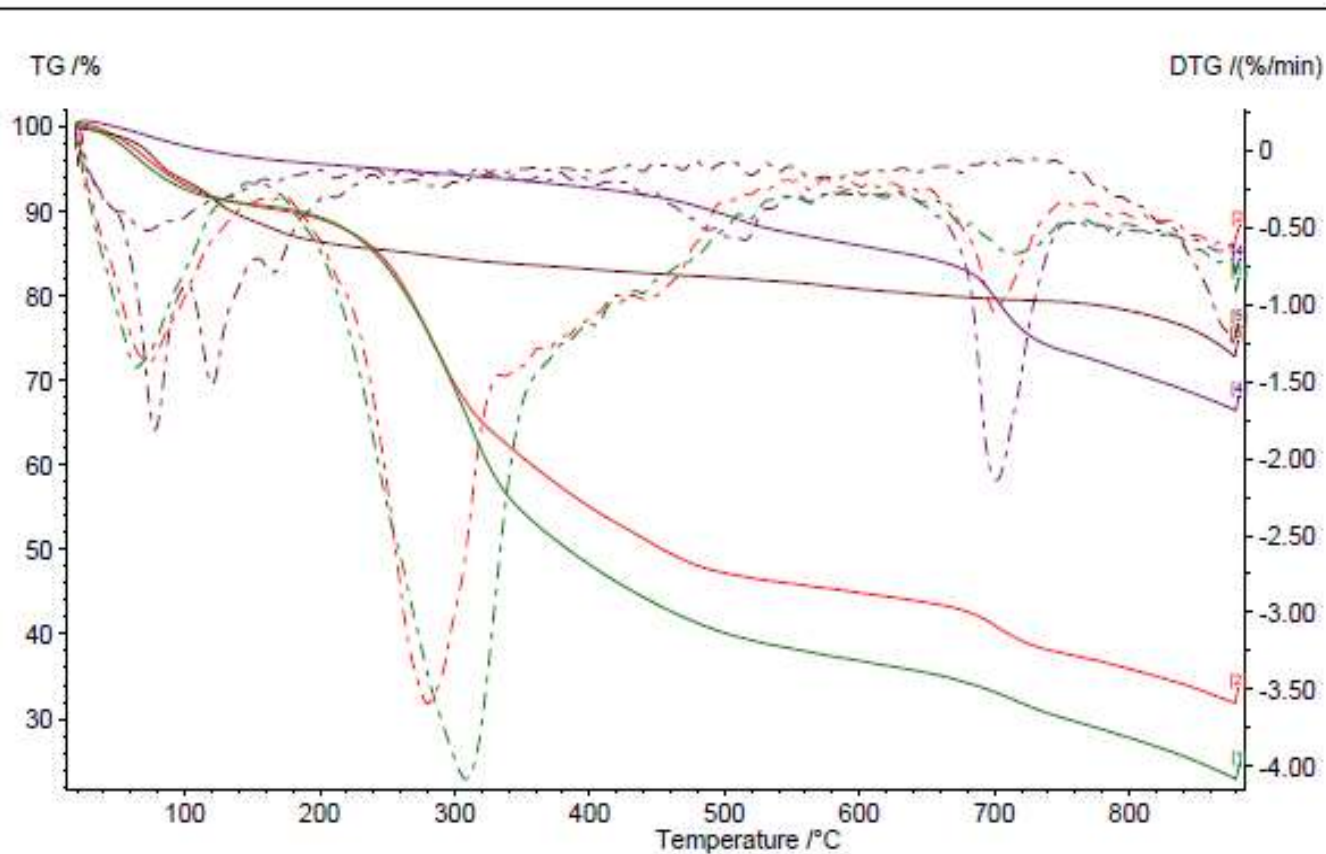
and

→ the presence of some gases

**MODULATE THE MASS OF AGGREGATES IN A
DETERMINING MANNER.**

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3. The possible effect also on the final dry product could be due precisely to the verified extraordinary stability of these aggregates in the solid phase.



Series: 22-02-2018 09:35

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