

## Introduction

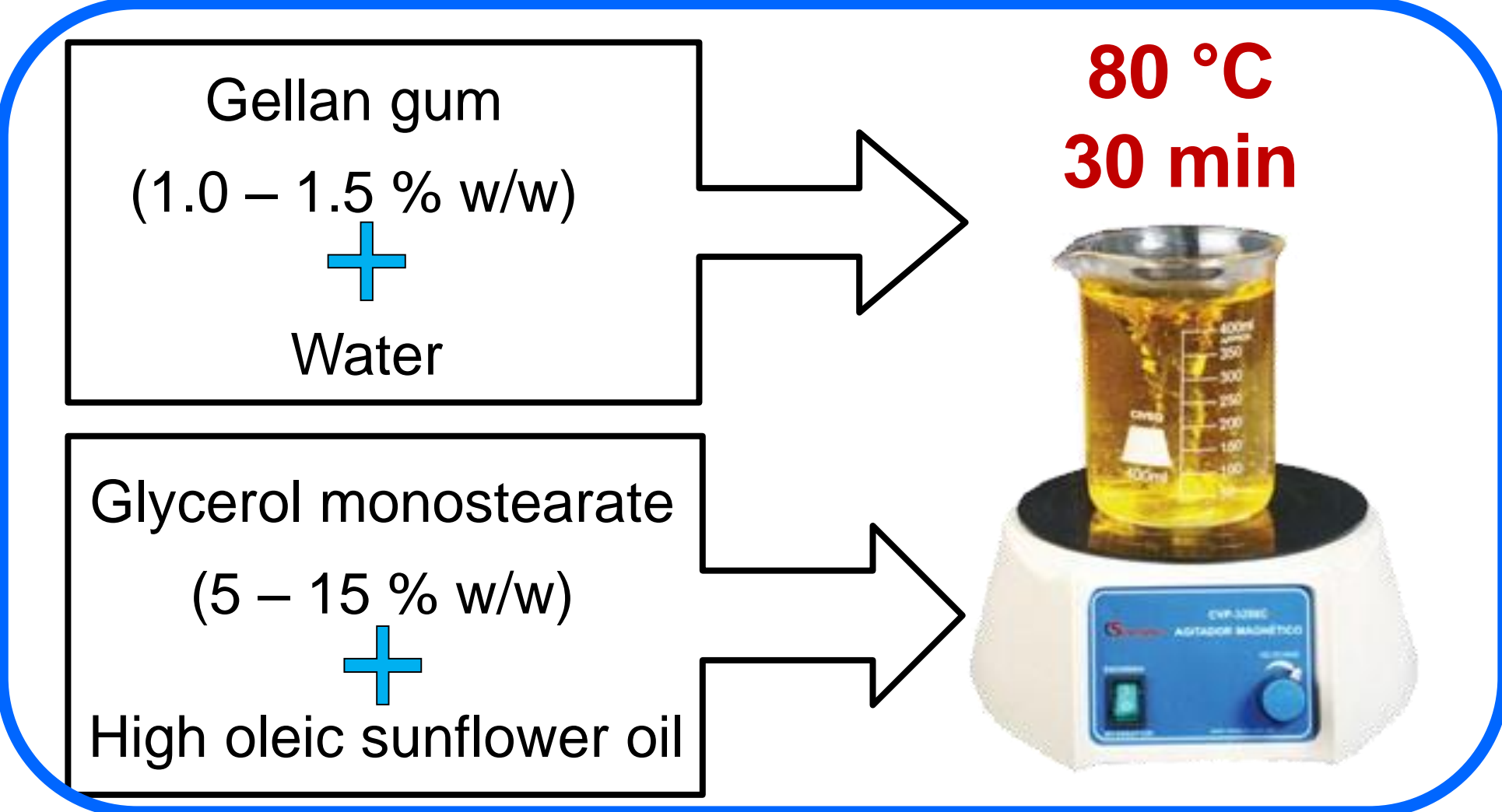
- Bigels** → Complex biphasic gels
- ↳ Organogel and hydrogel
  - ↳ Vehicle for hydrophilic and lipophilic compounds
  - ↳ Food, pharmaceutical and cosmetic applications

→ To our knowledge there are no papers evaluating the effects of process conditions on their properties

The aim of this work was the evaluation of the influence of process variables on physicochemical properties of bigels through multivariate analysis (PCA)

## Methods

### Organogel and Hydrogel preparation



### Bigel preparation

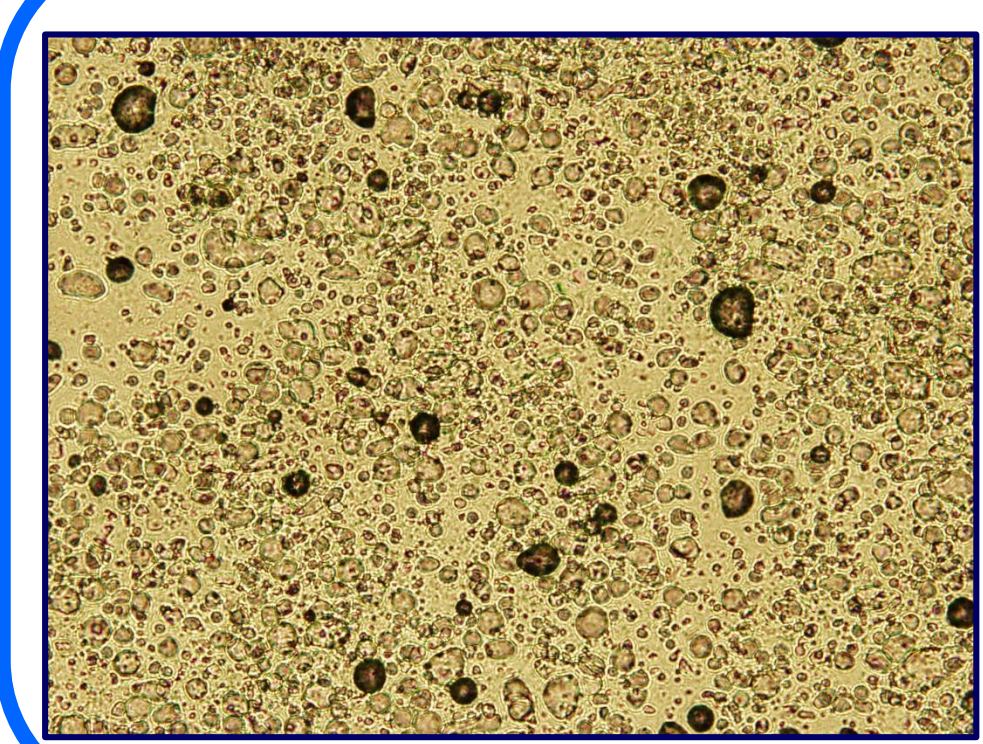


### Analysis

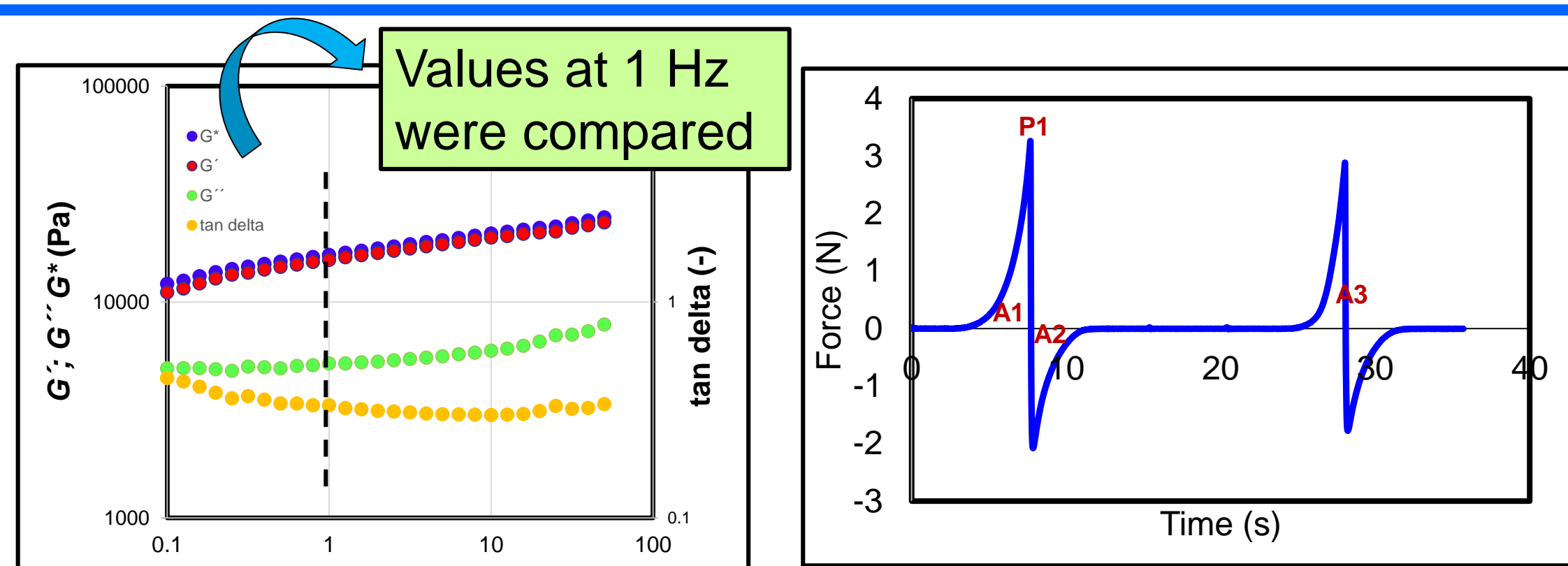
- Rheology
  - Frequency sweeps
- Mechanical properties
  - Double compression
- Optical microscopy
  - Mean diameter  $d_{32}$

## Results

### Patterns obtained



- Water-in-oil bigels
- Hydrogel particles
- Organogel continuous medium



- Spreadability: First peak (P1)
- Consistency: First positive area (A1)
- Adhesiveness: First negative area (A2)
- Cohesiveness: A3/A1 ratio

### Multivariate analysis (PCA)

Two factors were sufficient to explain 85.6 % of the variance

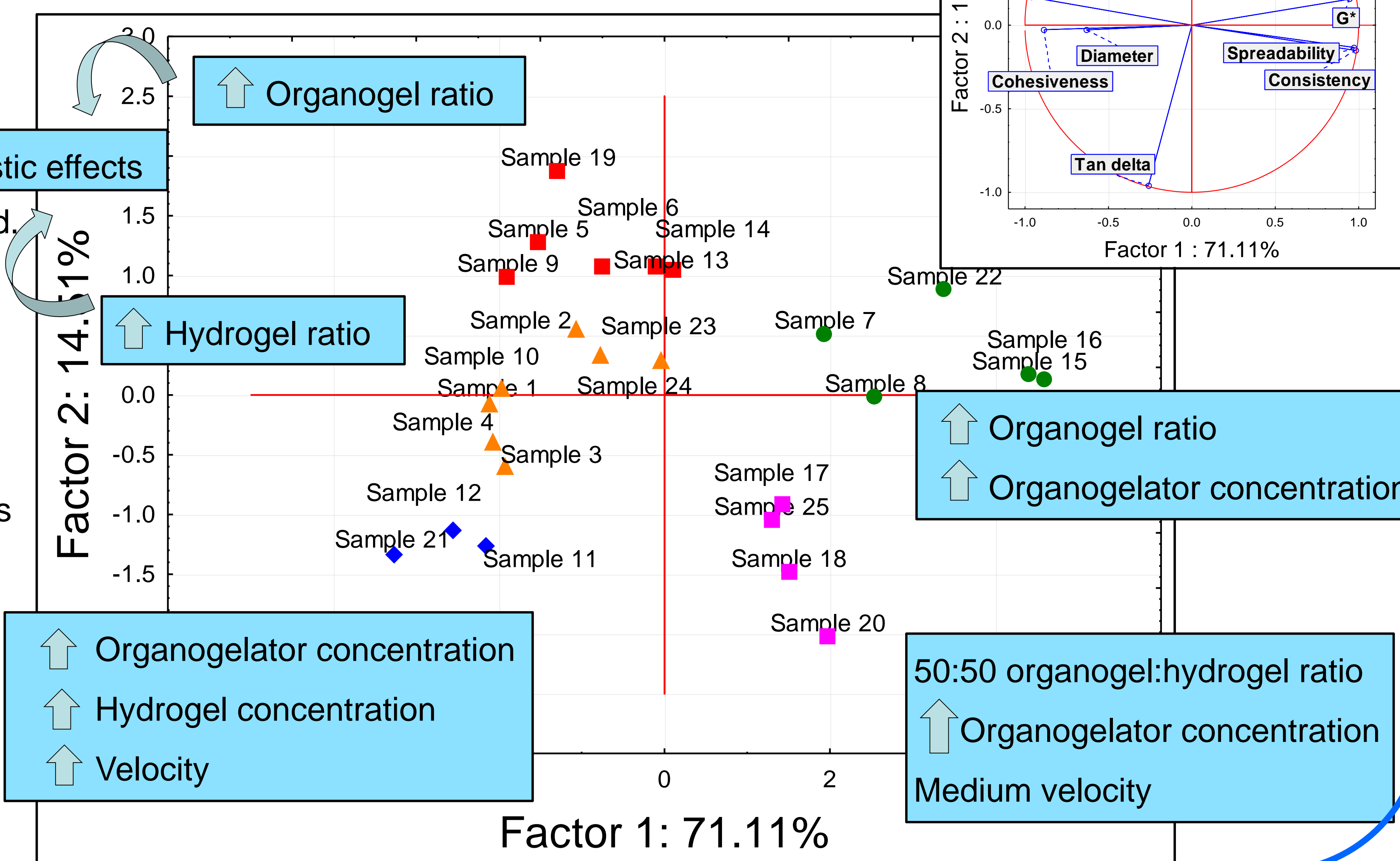
Spreadability, consistency and  $G^*$  are positively correlated. They are opposed to diameter, cohesiveness and adhesiveness

Horizontal axis corresponds to Organogel:Hydrogel ratio

- ↳ Organogel ratio → more structured systems
- ↳  $G^*$ , Spreadability and consistency

Vertical axis corresponds to mixing velocity

- ↳ Interactions among parameters evaluated
- ↳ Synergistic effects



## Conclusions

- ❑ Organogel:Hydrogel ratio was the parameter that exerted more influence on bigels' production process
- ❑ Different physicochemical properties can be obtained by tuning the parameters involved in the bigels' production process
- ❑ Softer or harder gels, with higher or lower spreadability, bigger or smaller particle size can be produced, depending on the desired final product and application

## Acknowledgements

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