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Morphological Study of Cyclopentane Hydrates in Brine Solutions for Desalination Application

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Morphological Study of Cyclopentane Hydrates in Brine Solutions for Desalination Application

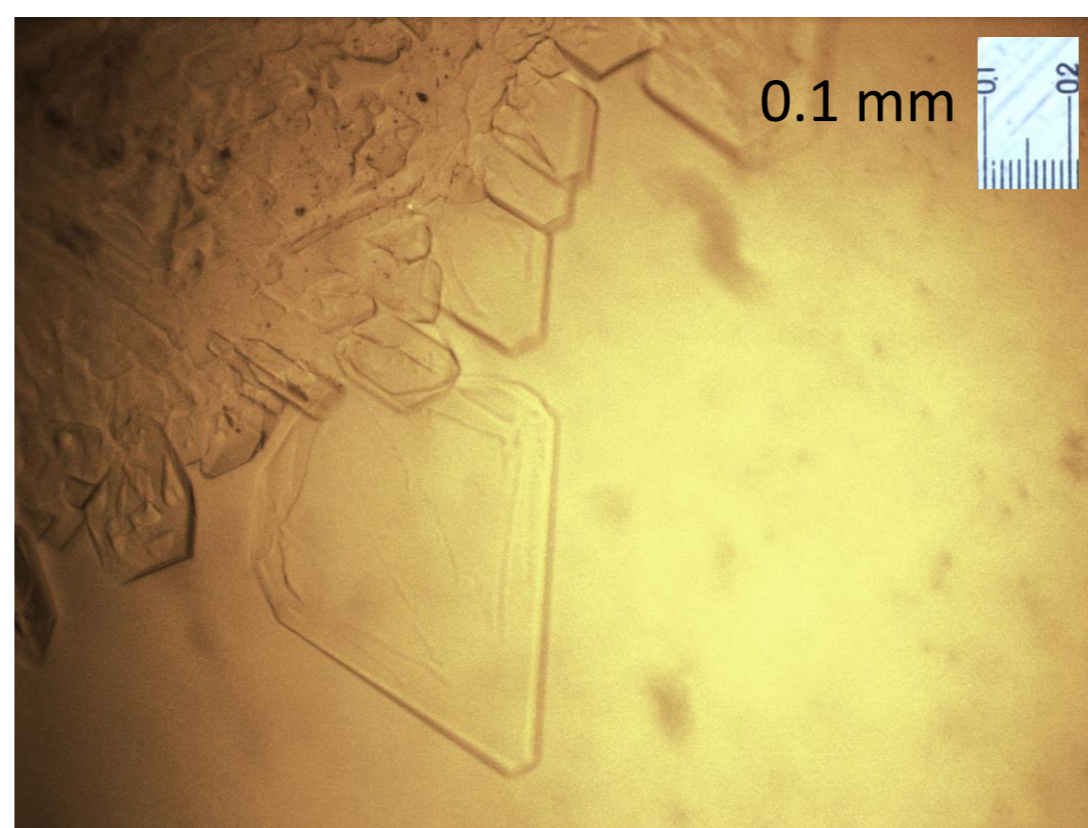
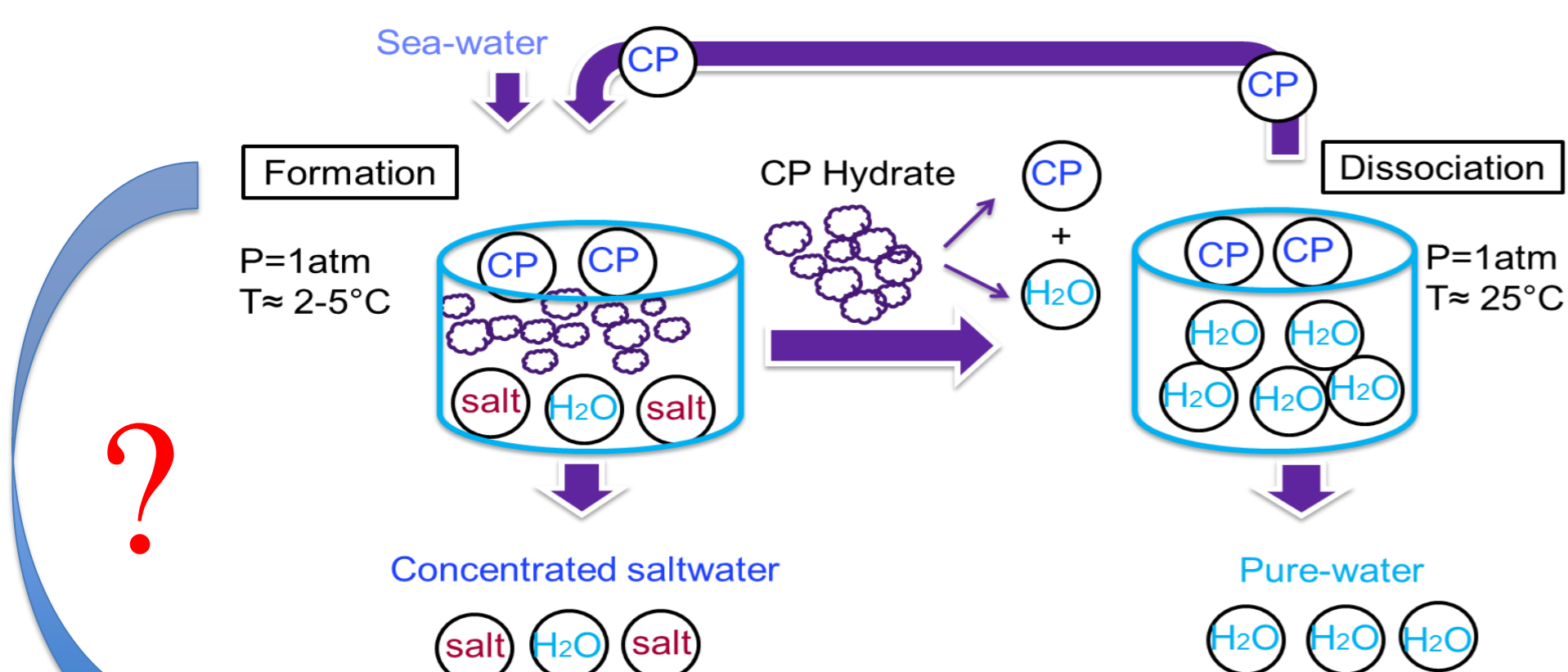
Son Ho-Van^{1,2*}, Baptiste Bouillot¹, Jérôme Douzet¹, Cameirao Ana¹, Garcia Daniela¹, Saheb Maghsoodloo¹, Jean-Michel Herri¹

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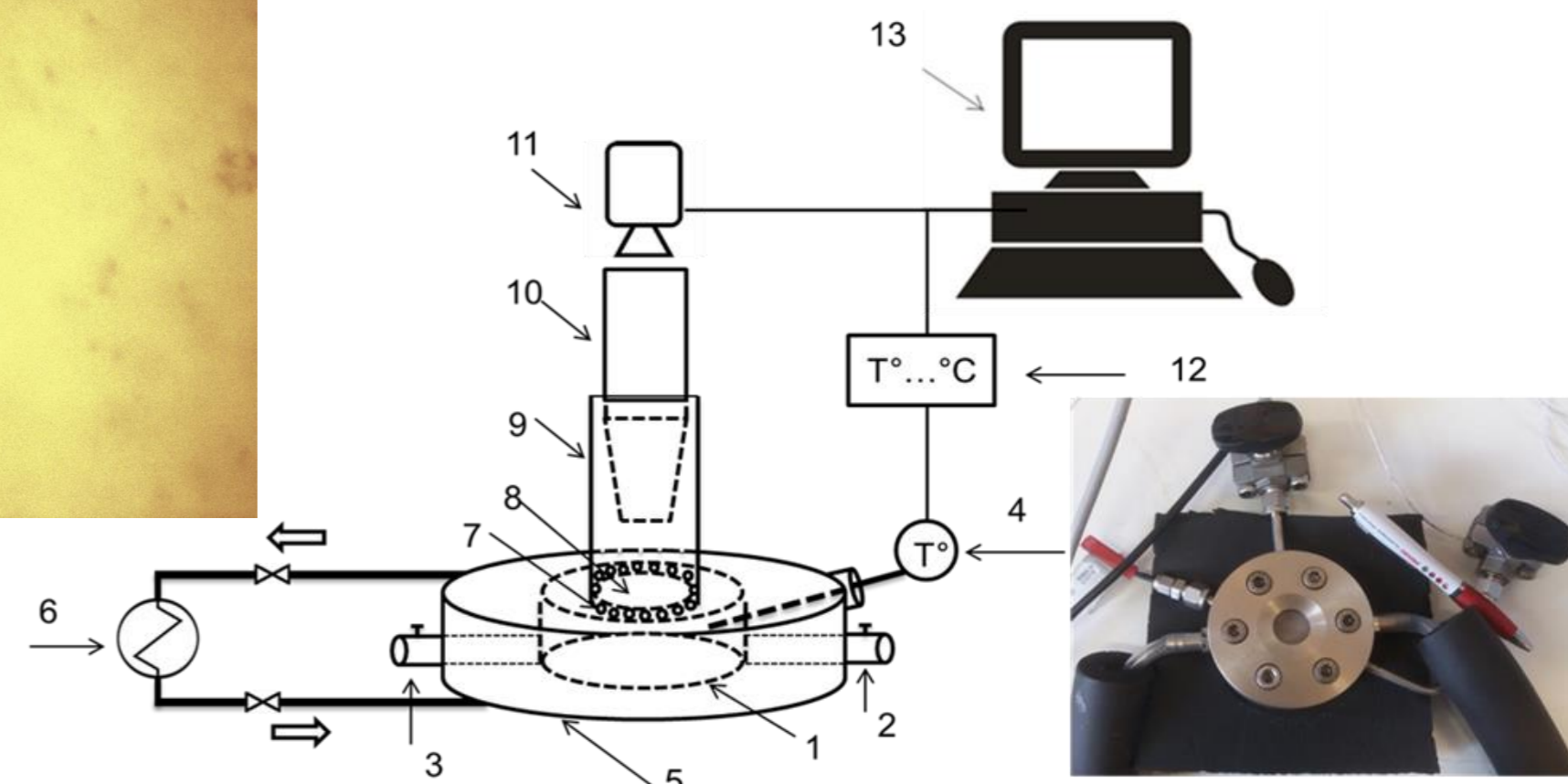
Introduction

Cyclopentane (CP) hydrates-based desalination



CPH crystals

Apparatus

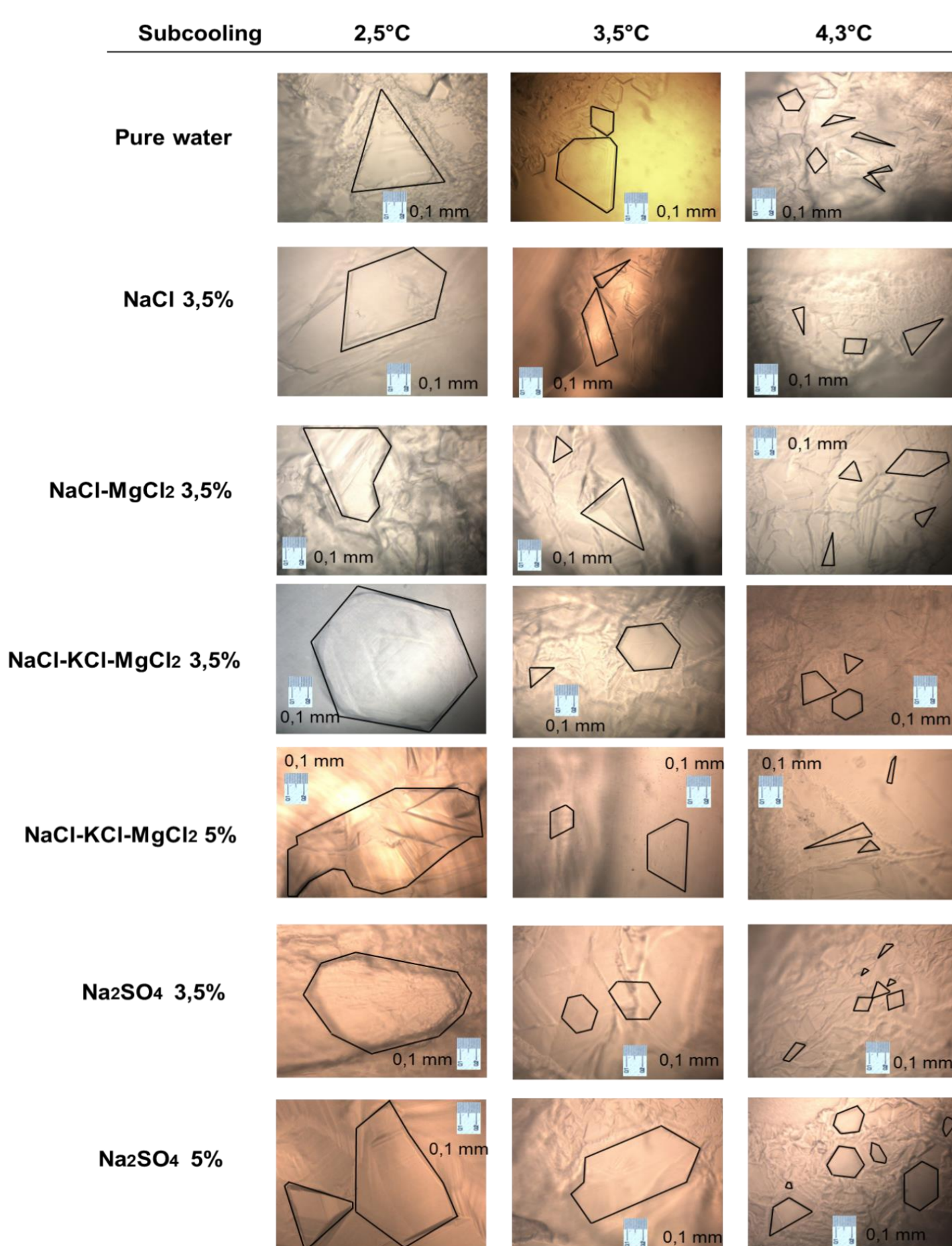


(1) Reactor; (2) input line; (3) output line; (4) Temperature probe; (5) Cooling jacket; (6) Chiller; (7) Silica gel; (8) Glass window; (9) Transparent tube; (10) Objective lens; (11) Camera; (12) Temperature transmitter; (13) Computer.

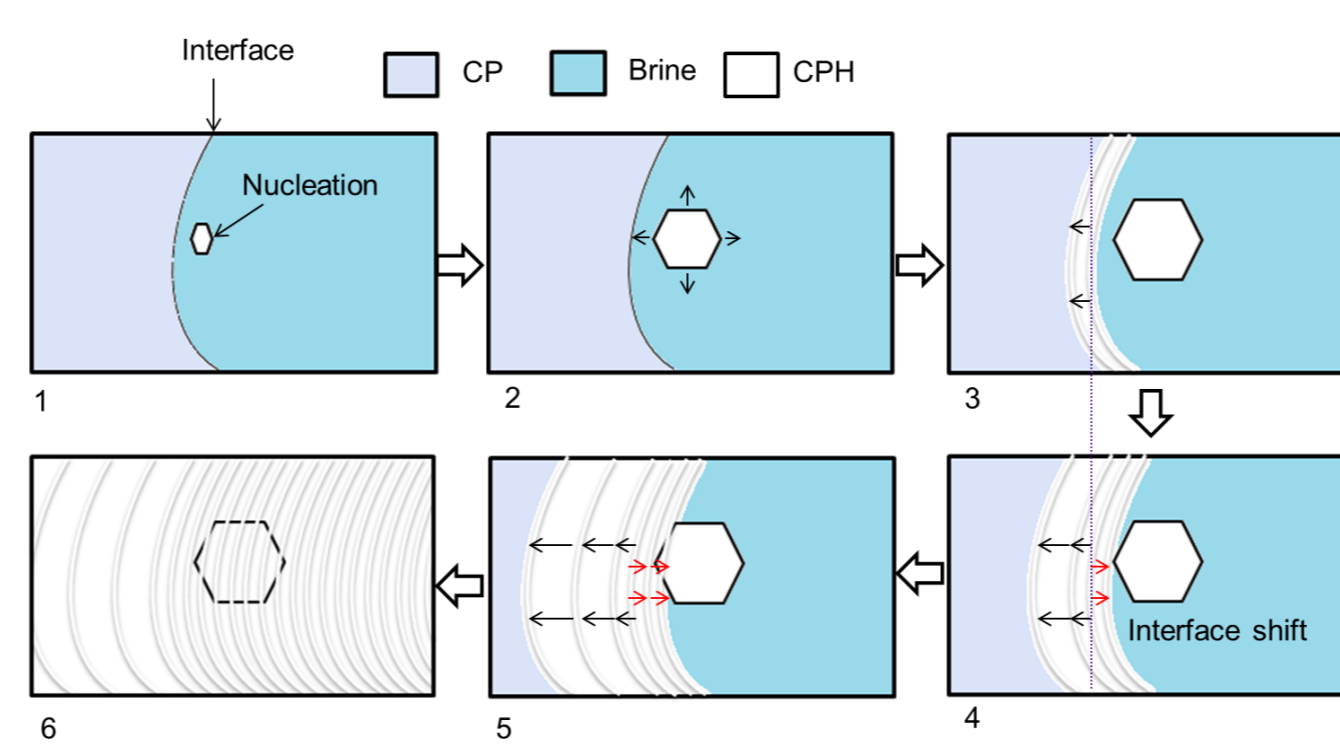
- ❖ Effect of salts & subcooling on morphology, kinetic of CPH crystallization?
- ❖ Mechanism of CPH crystallization?

Experimental results

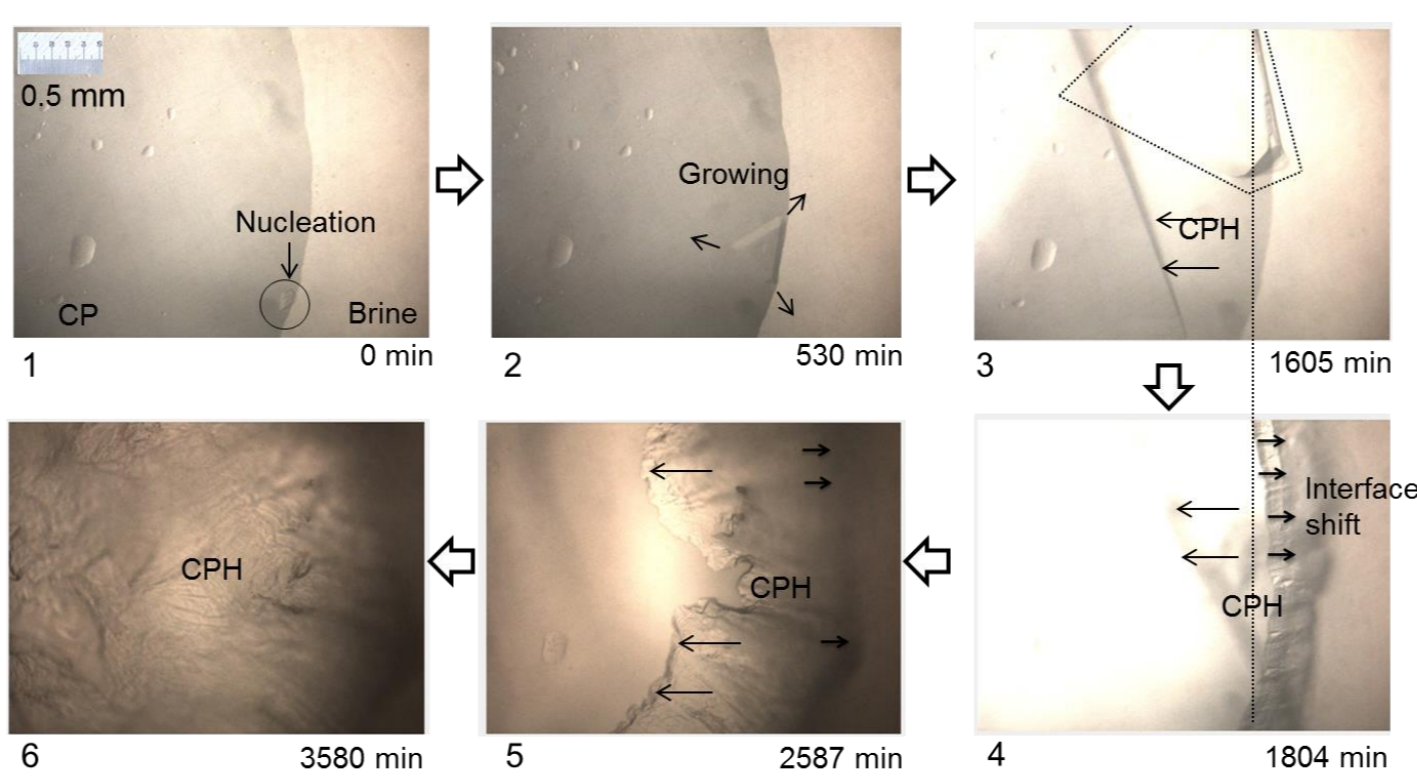
Morphology of CPH



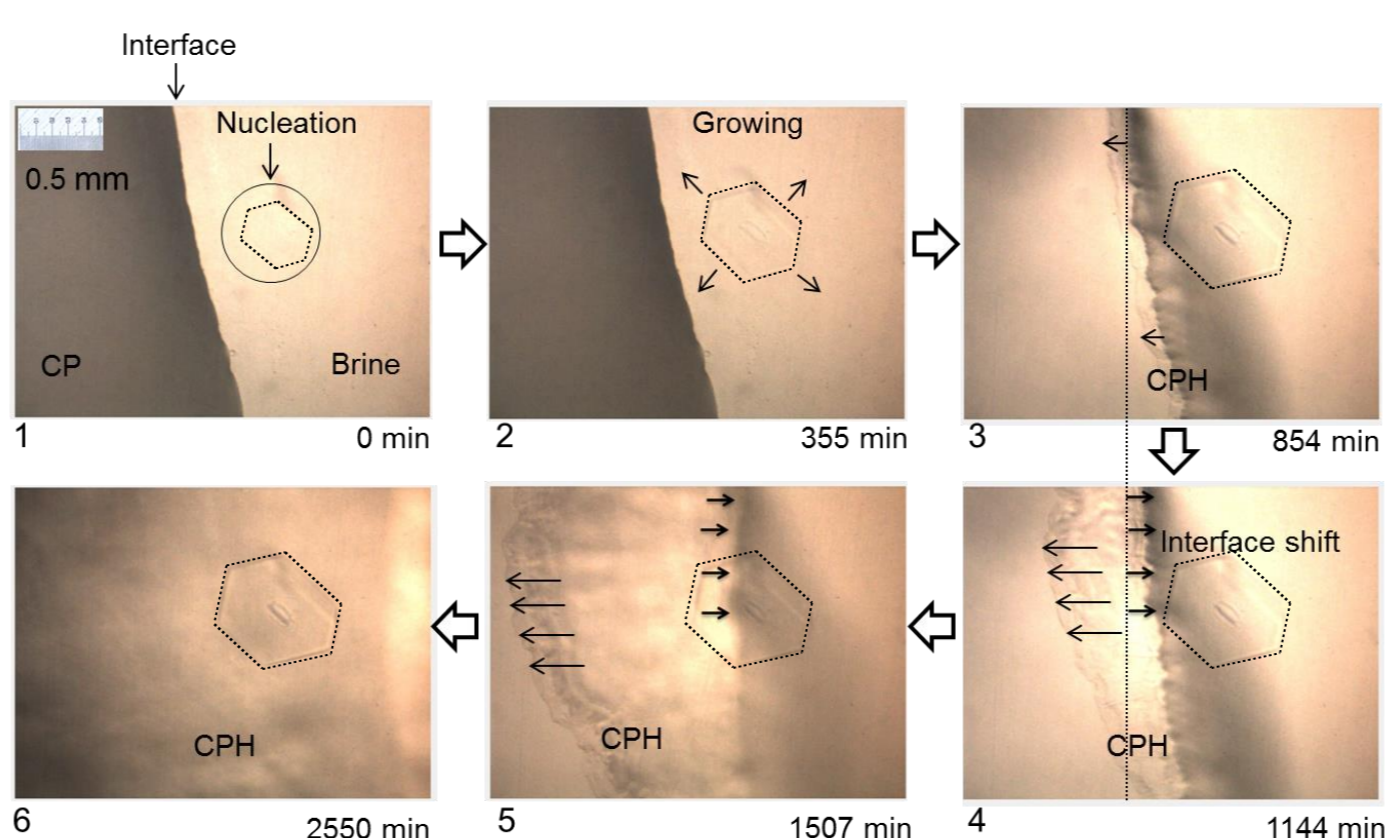
Mechanism of CPH Crystallization



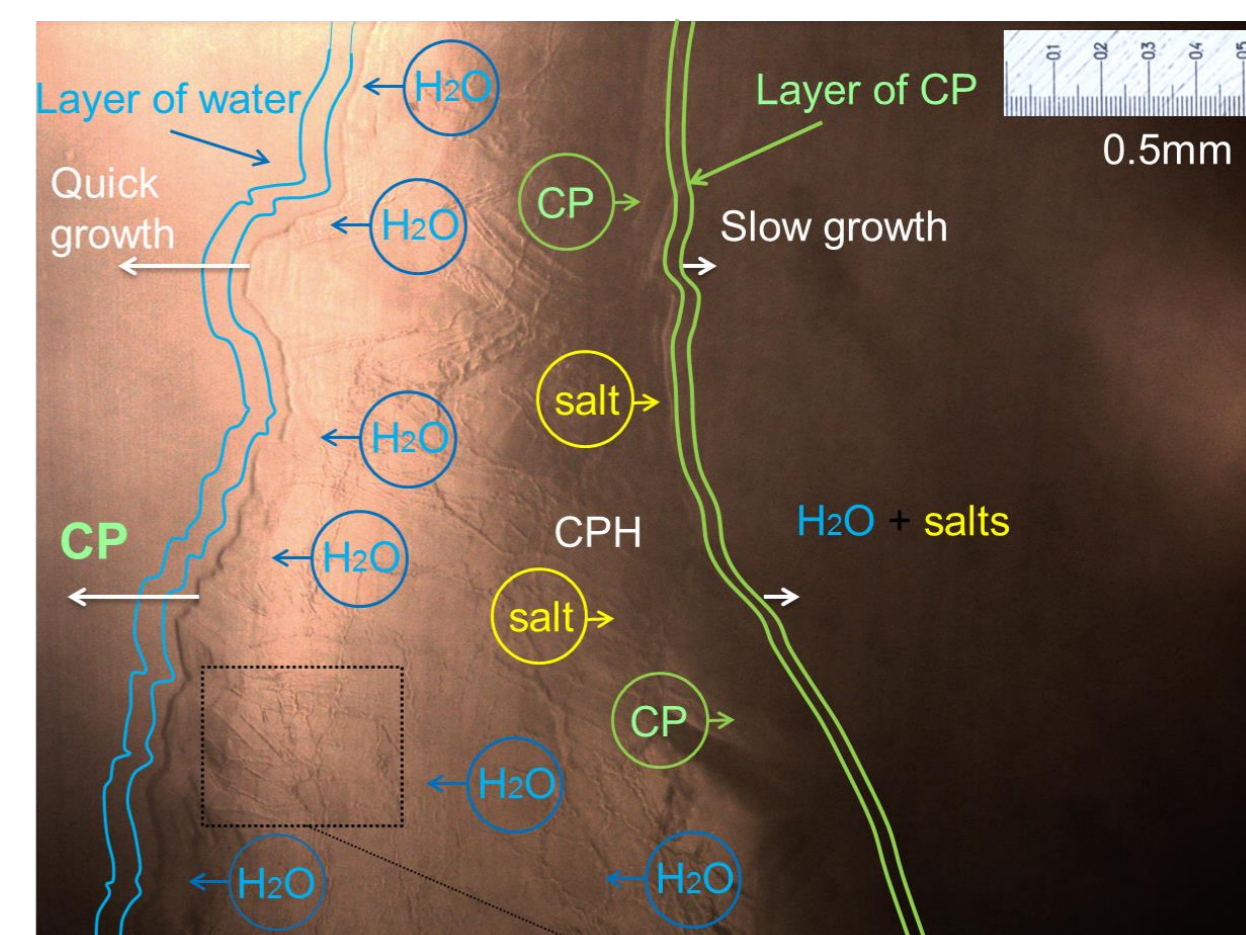
Simplified schematic of the CPH crystallization mechanism



With pure water at a subcooling of 2.5°C



With NaCl-KCl-MgCl2 5% at a subcooling of 3.5°C



Conclusions

- ❖ Size of the individual crystals decreases when increasing subcooling
- ❖ Salts reduce the growth rate
- ❖ The growth rate is proportional to subcooling

Kinetic of CPH crystallization

