

COLD SINTERING: Dense electroceramics at ultra-low temperature

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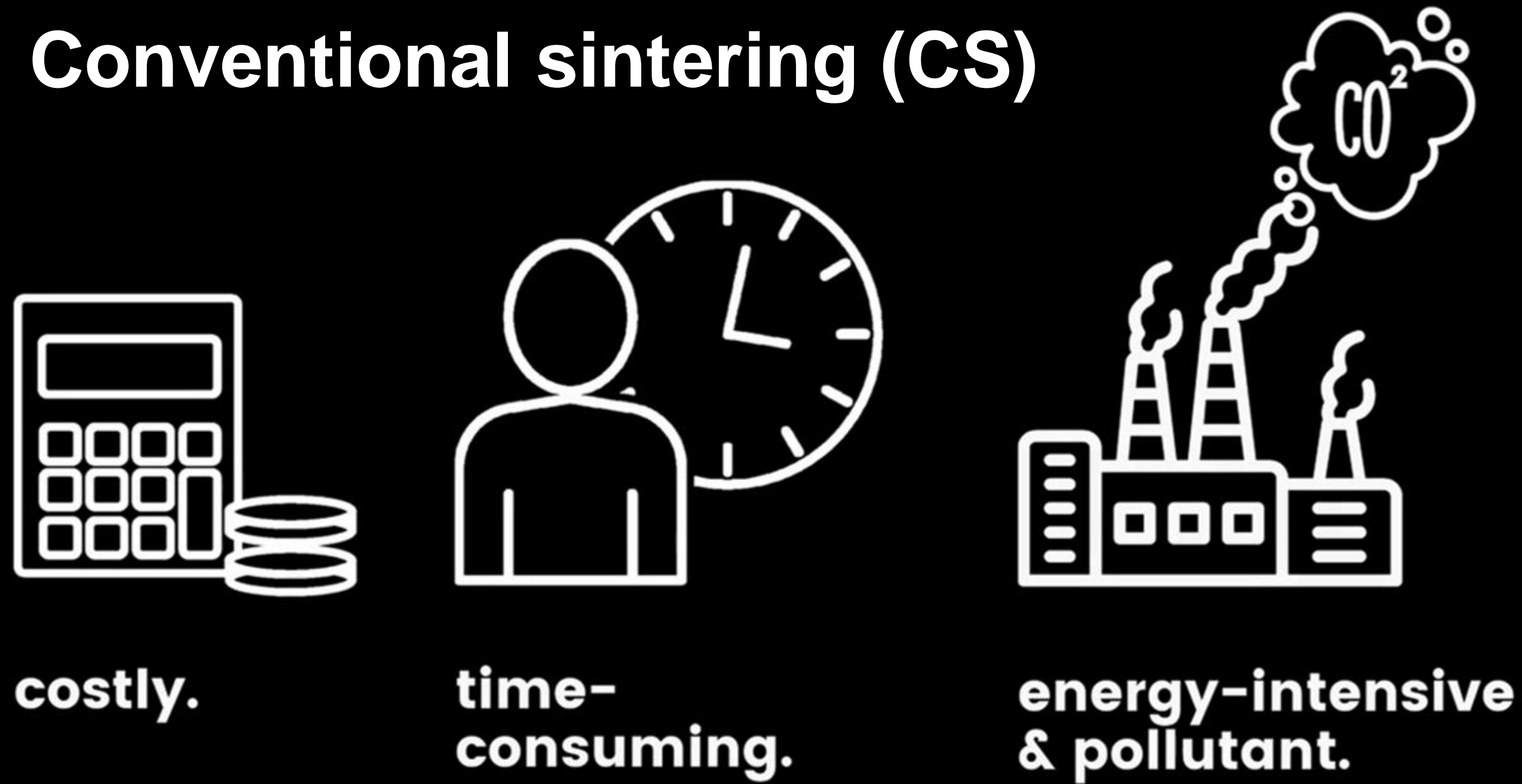
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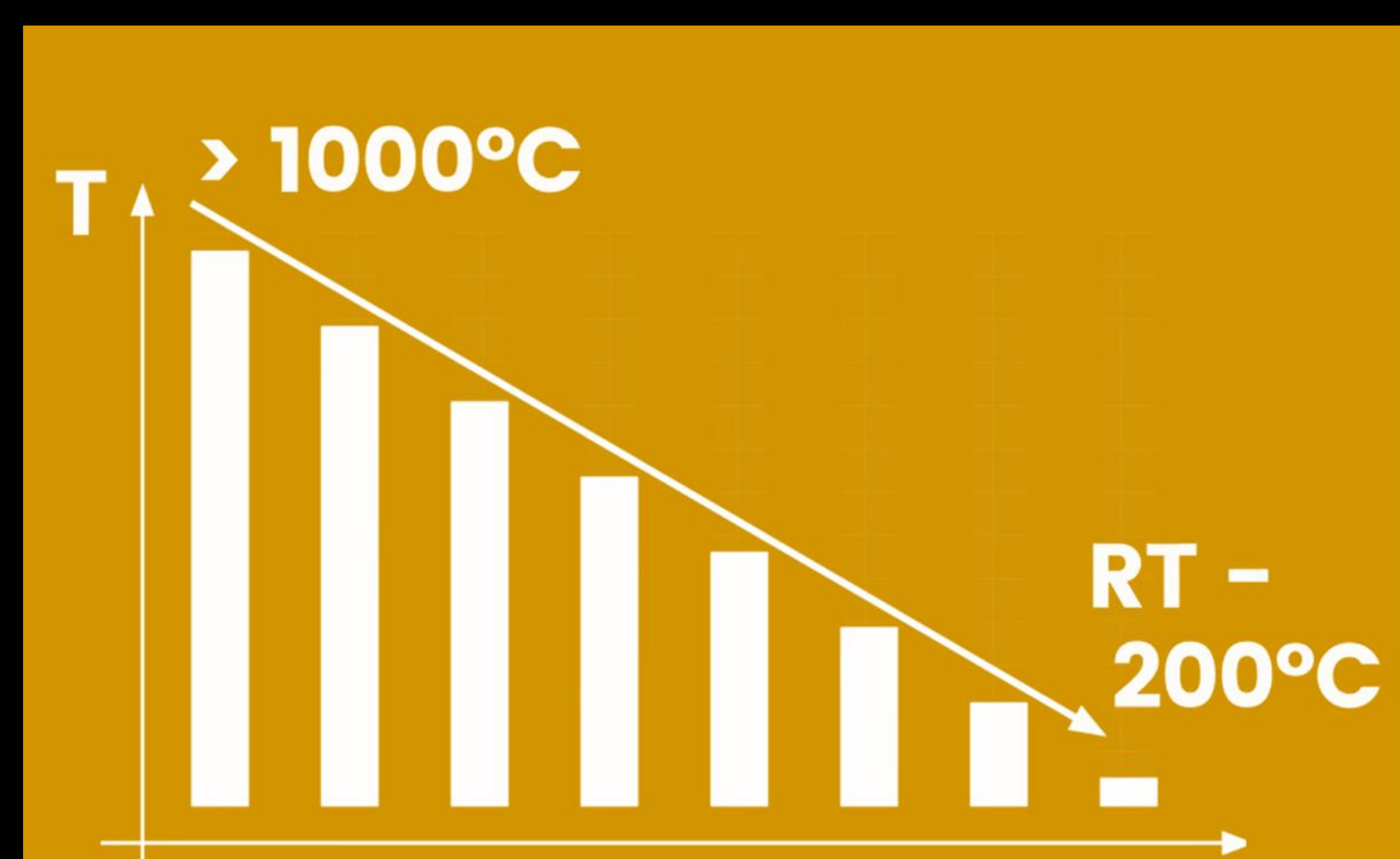
The Problem...

Conventional sintering (CS)



Radical reduction in sintering temperature of most ceramics.

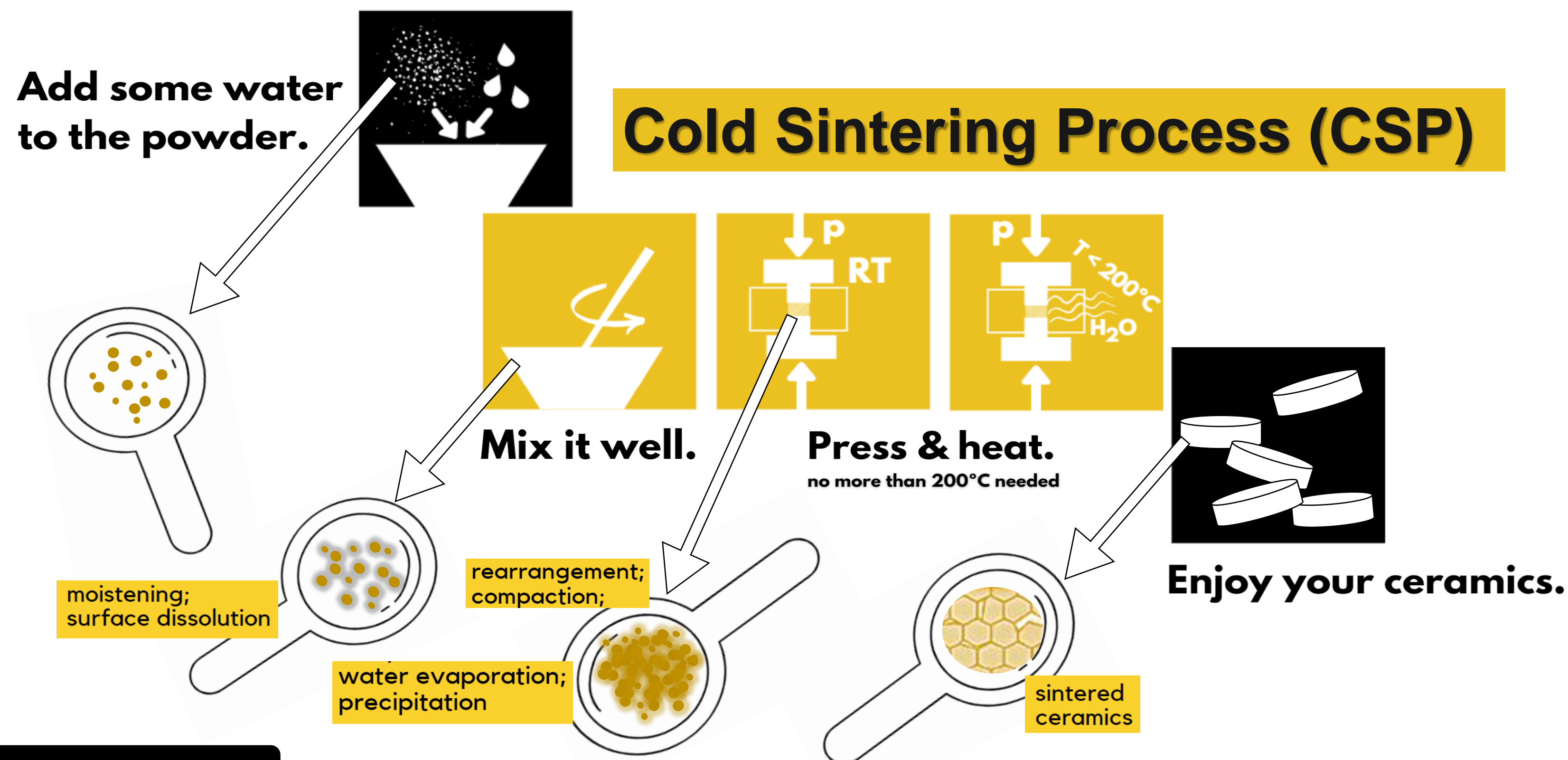
CS



CSP

The Solution...

Cold Sintering Process (CSP)



The road to sustainability!

Materials and methods

BST

Barium Strontium Titanate



Solid State Route:
Ball milling (BM)



Cold Sintering Process:
150 °C | 1h | 450 MPa
20 wt.% BaOH₂·8H₂O

KNN

Potassium Sodium Niobate



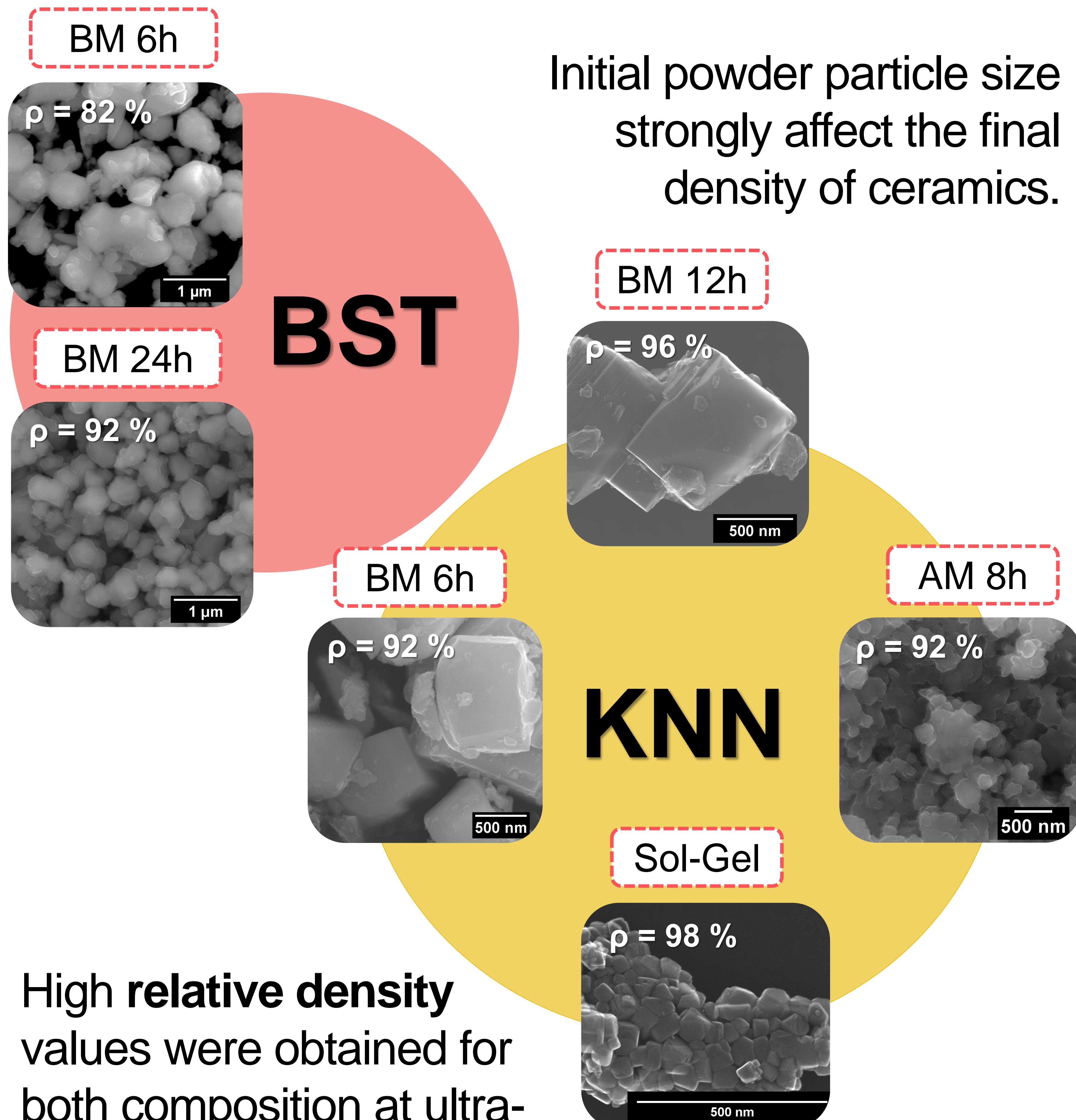
Solid State Route:
Ball milling (BM)
Attrition milling (AM)
Chemical Route:
Sol-Gel Method



Cold Sintering Process:
250 °C | 1h | 500 MPa
5 wt.% NaOH/KOH (1:1)

RESULTS

Initial powder particle size strongly affect the final density of ceramics.



High relative density values were obtained for both composition at ultra-low temperature!!

Acknowledgements

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