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Sol-gel transition in porous media

Interplay of drying and wetting

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List of publications

Publications covered in this thesis:

Chapter 2: **R. Le Dizès Castell**, M. Prat, S. Jabbari-Farouji, and N. Shahidzadeh, *Is Unidirectional Drying in a Round Capillary Always Diffusive ?*, *Langmuir*, 39, 5462–5468, **2023**

R.L.D.C. performed the experiments and M.P. developed the model and performed the numerical simulations. All authors contributed to the analysis and the writing and revision of the manuscript.

Chapter 3: **R. Le Dizès Castell***, E. Mirzahassein*, M. Grzelka, S. Jabbari-Farouji, D. Bonn, and N. Shahidzadeh, *Visualization of the Sol–Gel Transition in Porous Networks Using Fluorescent Viscosity-Sensitive Probes*, *The Journal of Physical Chemistry Letters*, 15, 628–635, **2024**

R.L.D.C and E. M. contributed equally to this work. R.L.D.C and E. M. performed the experiments and all authors contributed to the analysis and the writing and revision of the manuscript.

Chapter 4: **R. Le Dizès Castell**, M. Prat, N. Shahidzadeh, and S. Jabbari-Farouji, *Pore Network Models for the evaporation of complex fluids in porous media*, in preparation

R.L.D.C. performed the numerical simulations and the experiments. All authors contributed to the analysis and the writing and revision of the manuscript.

Chapter 5: **R. Le Dizès Castell**, L. Pel, T. Chekai, H. Derluyn, M. Scheel, S. Jabbari-Farouji, and N. Shahidzadeh, *Sol-gel transition by evaporation in porous media*, *Physical Review Applied*, 21, 034049, **2024**

R.L.D.C. and L.P performed the NMR experiments. R.L.D.C., M.S, S.J-F and N.S performed the experiments in Synchrotron SOLEIL. R.L.D.C, T.C and H.D analysed the tomography datas. R.L.D.C performed the rest of the experiments and analysis. All authors contributed to the writing and revision of the manuscript.

Chapter 6: **R. Le Dizès Castell**, L. Hamm, J. van der Laan, and N. Shahidzadeh, *Extreme swelling and rupture of aminopropyl silane gel in confinement*, in preparation

R.L.D.C., L.H. and J.v.d.L. performed the experiments. R.L.D.C and N.S analysed the

results, wrote and revised the manuscript.

Outside of this thesis:

R. Le Dizès Castell*, R. Sinaasappel*, C. Fontaine, S. H. Smith, P. Kolpakov, D. Bonn, and N. Shahidzadeh, *Frost damage in unsaturated porous media*, *Physical Review Applied*, 20-3, 034025, **2023**

R. Le Dizès, D. Jaïs, and N. Shahidzadeh, *Two-step treatments for the consolidation of carbonate stone artworks*, *Proceedings of SWBSS 2021–Fifth International Conference on Salt*, 225, **2021**

T. Heeremans*, S. Lépinay*, **R. Le Dizès Castell**, I. Yussuf, P. Kolpakov, K. P. Velikov, M. Steiger, and N. Shahidzadeh, *Controlled spherulitic crystal growth from salt mixtures*, in preparation

*These authors contributed equally to this work.