

# Analytical Setup for Kinetic investigations of Gel Ageing and Ambient Pressure Drying

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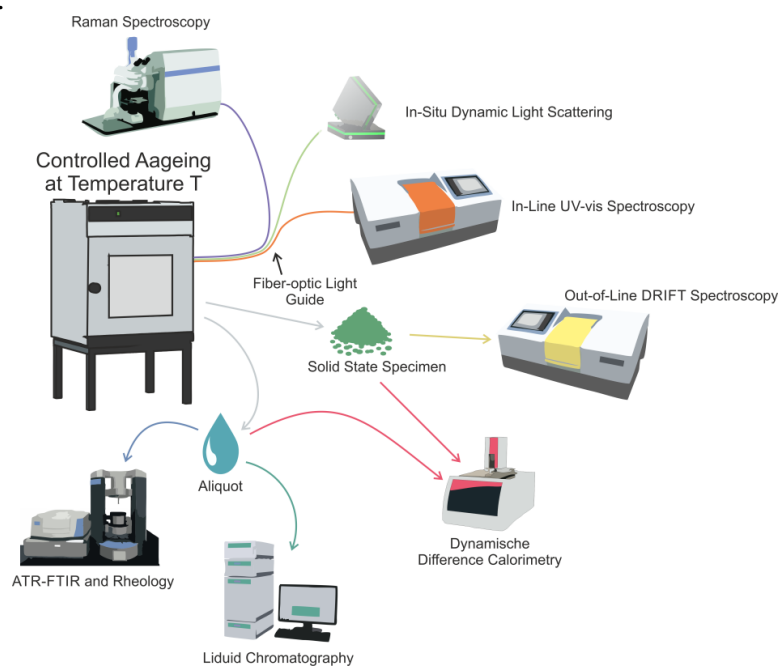
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Aerogels and xerogels - applied as insulating material, in catalytic processes, or as filter material – are expected to contribute significantly to industrial energy savings in the future. However, the scale-up of synthetic procedures for aerogels and xerogels to an industrially relevant scale requires is still hampered by lacking insights into the underlying kinetics of the sol-gel process, as well as of subsequent ageing and drying steps. Especially the latter steps have not yet been investigated in detail, thus providing ample opportunities for process optimization in terms of times and temperatures.

To this end, we are setting up an analytical platform for the kinetic analysis of sol-gel processes, as well as ageing, and drying processes under ambient pressure. It consists of a drying oven equipped with several analytical devices for in-line analysis or investigations of aliquots, respectively.

This poster describes the experimental setup and preliminary results of case studies using selected devices.



**Scheme:** Analytical setup.

**Acknowledgements:** Funding of the project “DLRAeroKinetics” by the Federal Ministry of Economic Affairs and Energy (FK03EN2023) is gratefully acknowledged.

## References:

1. M. A. Aegerter, N. Leventis, M. M. Koebel, *Aerogels Handbook*, Springer New York, **2011**.
2. a) G. Astarloa-Alerbe, J. M. Echeverria, J. L. Egiburu, M. Ormaetxea, I. Mondragon, *Polymer* **1998**, *39*, 3147-3153. b) I. Poljanšek, B. Likozar, M. Krajnc, *J. Appl. Polym. Sci.* **2007**, *106*, 878-888. c) J. C. Domínguez, M. Oliet, M. V. Alonso, E. Rojo, F.

| Rodríguez, *J. Appl. Polym. Sci.* **2012**, *123*, 2107-2114. d) K. Z. Gaca, J. Sefcik, *J. Colloid Interface Sci.* **2013**, *406*, 51-59.