

# Understanding the influence of morphology on the fractal and mechanical properties of silica aerogels

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The fractal morphology of silica aerogels has a significant influence on their mechanical properties. A possible approach for investigating this influence is to model their geometric structure by using diffusion-limited aggregation (DLA) and diffusion-limited cluster aggregation (DLCA) [1].

The DLCA algorithm generates clusters and networks of silica aerogels, allowing to compare their microstructure to those determined by small angle X-ray scattering (SAXS) experiments [2]. The influence of different input parameters of this algorithm e.g the particle radius or the concentration on the fractal properties is carried out by a parameter analysis. Furthermore, representative volume elements (RVE) are used within a finite element analysis (FEA) to study the mechanical behavior of the aggregation models under tension or compression.

## References

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