



## Manufacturing and tabletting of aerogel-based drug delivery systems

Poorly water-soluble active pharmaceutical ingredients (API) exhibit poor bioavailability due to their mostly crystalline state. One way to improve the bioavailability of such an API is to stabilize its amorphous state by incorporating it into matrices. Silica-based aerogels are mesoporous solids with high degrees of porosity as well as immense specific surface areas, making them ideal for this application. To date, however, there are only few studies dealing with the further processing of drug-loaded aerogels up to the ready-to-use dosage form. In particular, the tabletting of such highly porous materials presents a challenge. One of the reasons for this is the drastic reduction in pore volume caused by the compacting process. Accordingly, the question should be clarified to what extent the beneficial properties of the aerogels for drug release are impaired by tabletting.

**Begin:** 



In addition to the tabletting behavior, the synthesis of the aerogels is also to be systematically investigated in order to be able to set the properties of the carrier material in a defined manner and thus tailor them to the desired application (e.g. with regard to the release behavior). Possible starting points here are the particle size of the initial suspension and the functionalization of the aerogel surface.

If you have any questions, don't hesitate to ask me ©

## Remarks:

The temporal scope can be flexibly tailored to **bachelor**, student or master theses. Practical laboratory experience as well as prior knowledge from bio-, chemical- and pharmaceutical engineering are desirable.

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