



## Modern Freeze Drying Design for More Efficient Processes

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### Message from the Guest Editor

The paths to a more efficient freeze-drying process include controlling ice nucleation by a designed freezing process, a better in situ measurement technology for endpoint detection, and a better freeze dryer design such as rotating drums or novel heating technologies such as microwaves. New technologies like spray freeze-drying, modelling the sublimation process on a pore scale level, and new methods for in situ observations of the freeze-drying process are welcomed.

Topics include, but are not limited to, applications in the following areas:

- Novel processes (especially spray freeze drying, combined drying processes)
- Novel Equipment (rotating drums, microwave heating)
- Modelling of freeze drying including pore scale modelling of freeze drying process
- Controlling freezing for defined microstructure
- Impact of pore structure on freeze drying process including collapse
- Measurement technology for endpoint detection including design space
- Novel imaging methods for in situ observation of freezing and the freeze-drying process.





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