

Faster and More Controlled RF Heating for Lyophilization Based on Statistical Electromagnetics

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Categories:

- Biotechnology
- Pharmaceuticals

Keywords:

- Biopharmaceutical Manufacturing
- Biotechnology
- Drug Development
- Drug Manufacturing
- Electrically Conductive
- Electromagnetics
- Energy
- freeze drying
- Frequency
- Heating
- Industrial Biotechnology
- Lyophilisation
- microwave heating
- Pharmaceutical Analysis
- Pharmaceuticals
- Pharmaceutics
- Radio Frequency
- Spray Freeze Drying
- Sublimation Rate
- Thermally Conductive

Researchers at Purdue University have created a high power Radio Frequency Heating method that is controllable and optimal through statistical electromagnetism. Frequencies are selected based on type of material, frozen bulk is then uniformly heated volumetrically, and heat energy is distributed uniformly. The novel setup saves time, reduces energy consumption in the lyophilization process, and creates a product loss factor of less than one tenth for organic constituents. The advanced RF technique features an additional abrupt turn-off option for precise control of heating, relieving any need to adjust time, temperature, pressure, or shelf layouts for vials to obtain better results. Freeze drying can become considerably more efficient for pharmaceutical manufacturing and developing biotechnology.

Advantages:

- Heating uniformity
- Selective heating within chamber
- Less product loss
- Saves time
- Abrupt turn off feature

Potential Applications:

- Pharmaceutical drug manufacturing
- Biotechnology development
- Food industry/freeze drying meats, coffee, etc.

People:

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Intellectual Property:

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