

ACCELERATING OUR FUTURE IN SPACE



Dr. Ken Savin
ISS National Laboratory
Lyophilization – For Discussion



Lyophilization

- Lyophilization or freeze drying is a process in which a sample is dissolved in water and then frozen then water is removed (while still frozen) by sublimation (solid to vapor state) under vacuum.
- This is a process beneficial to the manufacture of pharmaceuticals, biologicals, food and other products that are heat sensitive or unstable when stored in solutions with water or that need to be stored for periods of time and are stable in the dry state.



ACCELERATING OUR FUTURE IN SPACE



FIND IT AT
#ISSRDC

Examples of Products Prepared Using Lyophilization

- Medications
- Chemicals
- Cells and Tissues
- Plasma
- Vaccines and Biotechnology Products
- Food products like Coffee, Tang, Meats, Fruits and Vegetables



ACCELERATING OUR FUTURE IN SPACE



FIND IT AT
#ISSRDC

Different Formulations Can Deliver Products with Different Properties



Formulation Screening and Freeze-Drying Process Optimization of Ginkgolide B Lyophilized Powder for Injection
Daichun Liu, Federico Galvanin, Ying Yu Published in AAPS PharmSciTech 2017
DOI:10.1208/s12249-017-0858-2

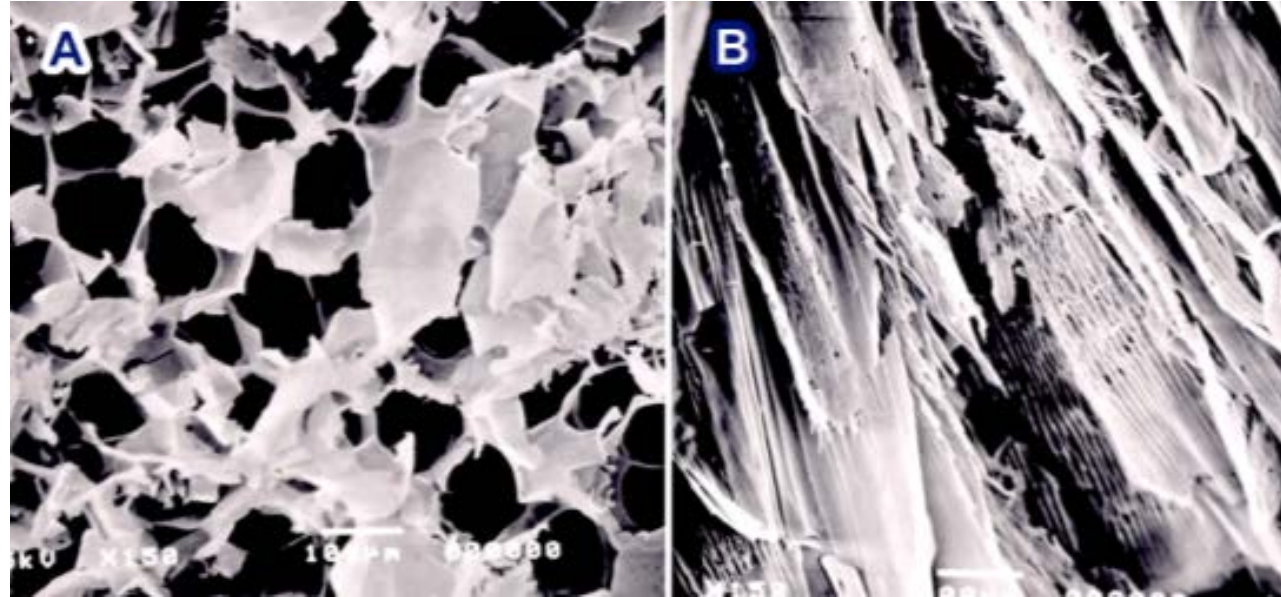


ACCELERATING OUR FUTURE IN SPACE



FIND IT AT
#ISSRDC

Some Materials Deliver Products of Different Form



SEM picture of dextran samples that were lyophilized with different freezing processes.

Chang, B.S. and Patro, S.Y. 2004. Freeze-drying Process Development for Protein Pharmaceuticals. in “Lyophilization of Biopharmaceuticals” (Costantino, H.R. and Pikal, M.J. eds) American Association of Pharmaceutical Scientists. Pp.113-138

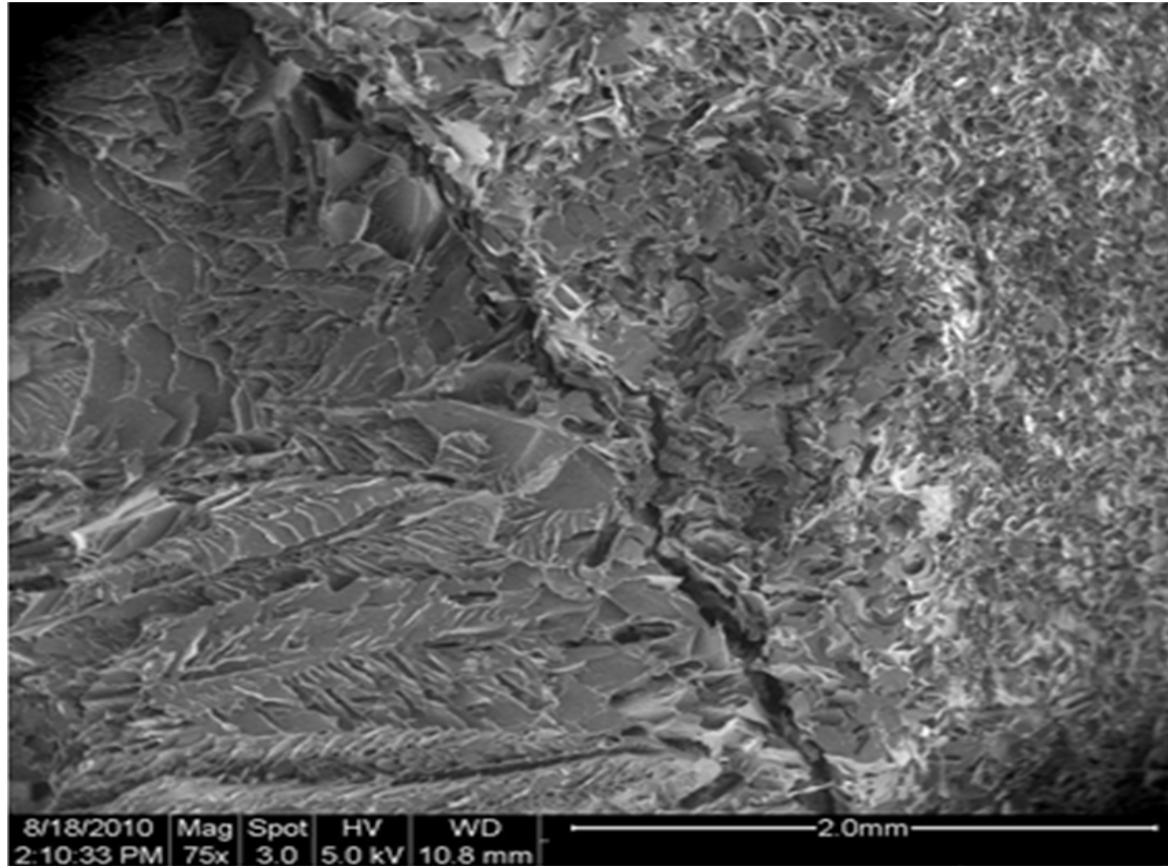


ACCELERATING OUR FUTURE IN SPACE



FIND IT AT
#ISSRDC

Same Material Delivers Different forms by Same Process



Shared with Permission to use by Eli Lilly and Co.



ACCELERATING OUR FUTURE IN SPACE



FIND IT AT
#ISSRDC