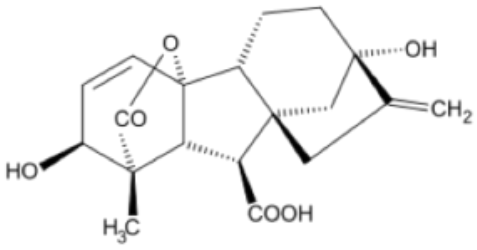
Concentration of Gibberellins (Pharmaceutical)

NFX Nanofiltration Membrane

Background

Gibberellins (GA_3) are the plant hormones that can be used to stimulate plant growth by influencing various developmental processes such as stem elongation, germination, and dormancy. The application of these hormones has led to significant increases in the yields of rice, wheat, corn, vegetable, and fruit harvests. An efficient and reliable method for concentrating gibberellins such as nanofiltration, is vital for pharmaceutical companies manufacturing these hormones.



Structure of Gibberellins

Feed Solution, Membrane, Operating Conditions

Feed Solution	
Material	Gibberellins, GA_3 ($C_{19}H_{22}O_6$)
Molecular Weight (Da)	346.37
Manufacturer	Jiangsu Fengyuan Bioengineering Co.,Ltd.
Conductivity	4,000
Membrane	
Element	NFX-3-8040HF
Spacer size (mil)	46
Number of Elements	20
Surface area per element (sq. ft)	295
Operating Conditions	
Element Inlet Pressure (PSI)	174-181
Pressure Drop per Element (PSI)	3-5
Temperature (°C)	30-32
pH	5.4-5.8

Pilot Unit Used During the Study

Test Results & Conclusions

Results	
Experiment Duration (min)	200
Overall rejection	99%
Concentrate Volume (Gal)	8,453-9,774
Average Permeate Flux (GFD)	15
Permeate Conductivity (µs/cm)	570-810

The NFX membrane exhibited a 99% rejection of GA_3 over the course of the 200 minute trial. The ultimate concentration factor ranged from 2.1-2.5 with an average permeate flux of 15 GFD. With this combination of rejection and flux, the NFX Nanofiltration offers excellent overall performance in this application.