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Crystallization Method to Reduce Filtration Time of Agrochemicals

A new crystallization methodology optimizes the process time and significantly reduces filtration time, offering agrochemical companies a more efficient path to achieving product purity standards.

Purdue University researchers have developed a crystallization methodology for more efficient purification of agrochemical compounds. Agrochemical companies need to abide by purity standards for the products and compounds they produce. Crystallization is a common technique utilized to refine impure compounds but is rife with challenges including long process and filtration times. To address these problems, Purdue University researchers developed an approach that optimizes the process time of crystallization. The system measures the real-time turbidity of the crystallization process and converges on a temperature to achieve optimum crystal growth. This technology has been used on a proprietary agrochemical compound and displayed three to four times faster filtration after crystallization of 200 grams of material (in 500 milliliter and 2-liter chambers) than traditional filtration methods. Successful implementation of this method not only generates feasible process parameter trajectories of an unknown agrochemical crystallization process with minimal thermodynamic knowledge, but also provides invaluable process and thermodynamic data (solubility, metastable zone width, crystallization kinetics) for future experimental or modeling studies. This technology promises to provide agrochemical companies with a more efficient process for attaining purity standards through crystallization.

Technology Validation: With a proprietary agrochemical compound, the researchers improved filtration times three to four fold over traditionally used filtration methods.

Advantages

-Increased Efficiency of Agrochemical Compound Crystallization

-Significantly Reduces Filtration Time

Technology ID
2020-NAGY-69085

Category
Biotechnology & Life Sciences/Bioprocessing & Biomanufacturing
Pharmaceuticals/Drug Discovery & Development
Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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-Rapid Process Design of Unknown Agrochemical Crystallization Systems

Applications

-Agrochemical Crystallization

-Compound Purification

TRL: 3

Intellectual Property:

Provisional-Patent, 2020-11-11, United States | Utility Patent, 2021-11-10, United States

Keywords: Agrochemical crystallization, compound purification, filtration time reduction, real-time turbidity measurement, crystal growth optimization, process design, crystallization kinetics, purity standards, solvent evaporation, solution crystallization