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Polymer Salts for Improved Drug Delivery from Amorphous Solid Dispersions

Ionized polymer salts significantly improve drug release and allow for higher drug loading in amorphous solid dispersions, offering enhanced solubility for easier pharmaceutical manufacturing.

Researchers at Purdue University have developed polymer salts with high rates of dissolution that improve drug release, particularly for lipophilic drugs, that can account for approximately 90% of developmental or approved drugs . Typically, protonated polymers have been used as enteric coatings to prevent drug release in the stomach. These polymers developed for use as enteric coatings have been used in the formulation of amorphous solid dispersions (ASD), where the drug is molecularly dispersed in a polymer matrix. However, only low amounts of the drugs can be blended with the polymers due to their low rates of dissolution upon reaching their target. The Purdue researchers found that ionizing an enteric polymer into a polymer salt had a higher rate of dissolution in the drug's target area and improved the drug release from ASDs until after the formulation exited the stomach. These polymer salts also have improved solubility in organic solvents, allowing easier processing.

Technology Validation: The drug release profile of an enteric non-ionized polymer was compared with an ionized polymer salt, and it was observed that the rate of drug dissolution and release for the ionized polymer salt was twice that of the non-ionized polymer.

Related Publication: Qingqing Qi, Lynne S. Taylor. Improved dissolution of an enteric polymer and its amorphous solid dispersions by polymer salt formation. International Journal of Pharmaceutics. Volume 622, 2022, 121886, ISSN 0378-5173. https://doi.org/10.1016/j.ijpharm.2022.121886.

Advantages

- Allows for higher drug loading

- Soluble in organic solvents

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Category
Chemicals & Advanced Materials/Specialty & Performance Chemicals
Chemicals & Advanced Materials/Materials Processing & Manufacturing Technologies
Pharmaceuticals/Drug Delivery & Formulations
Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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View online

- Higher drug release performance

Applications

- Pharmaceuticals manufacturing

TRL: 3

Intellectual Property:

Provisional-Gov. Funding, 2022-02-14, United States | Provisional-Gov. Funding, 2022-08-18, United States | PCT-Gov. Funding, 2023-01-18, WO | NATL-Patent, 2023-01-18, Europe | NATL-Patent, 2024-07-26, United States

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