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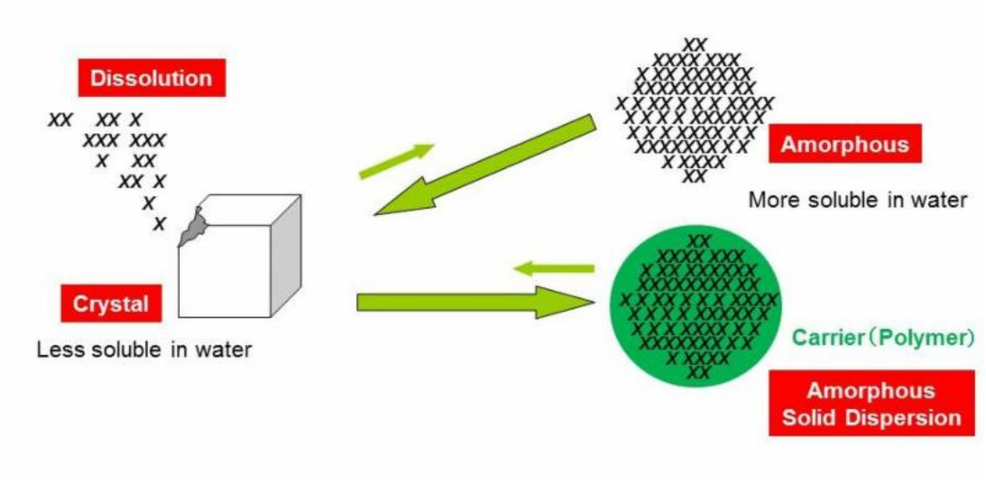
Fuji Chemical Industries USA, Inc.

Fuji Spray Drying Newsletter

Vol 3: Improving Solubility through Solid Dispersion

Innovation for small-molecule compounds

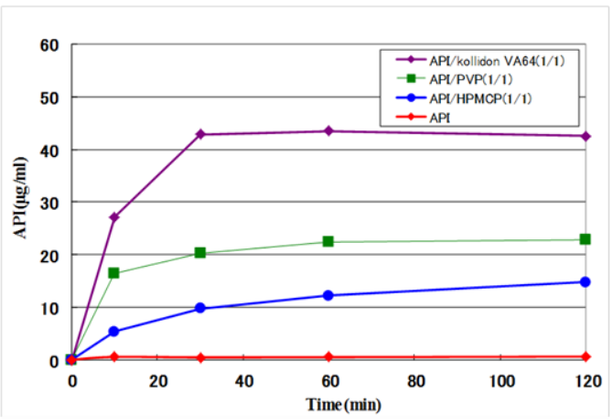
Solid Dispersion



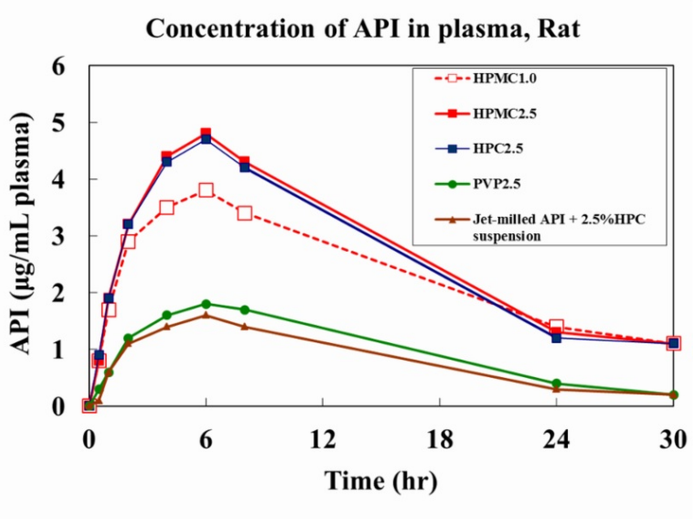
Amorphous forms of drugs are known to have more solubility than their crystal counterpart. However, amorphous drugs readily change into crystal form by heat, light, and mechanical shock, because energy level of amorphous state is higher than that of crystal. Amorphous solid dispersions which are dispersed in an inactive carrier (generally polymer is used) is able to maintain stable amorphous state. It is demonstrated that solubility of amorphous solid dispersions is improved remarkably, and supersaturated state of amorphous solid dispersions is maintained for a long time in many drugs. It is expected that BA (bioavailability) of drugs is improved, and drug dosage can be decreased due to these benefits.

Improved Solubility

As you can see from the dissolution test results, solubility of an amorphous solid dispersion of poorly water-soluble drug A is improved remarkably compared to that of crystal. Also, polymer selection is important based on these results, because three amorphous solid dispersions exhibit different solubility, depending on the selected polymer.



Dissolution Profile of Product A Solid Dispersion



In the case of the concentration in rat plasma , amorphous solid dispersions of a drug maintain higher concentration than jet-milled drug, and solubility improvement of amorphous solid dispersion is effective not only in vitro but in vivo.

In this issue of our technical newsletter, we have shown you an outline of our technical service and GMP support. For more details, please contact our U.S. office office shown below:

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