Non-Mass Transfer Limited Crystal Growth

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There are many different active pharmaceutical ingredients (APIs) that have been discovered in research labs all around the world that can be used to treat and cure patients with a variety of different ailments. The challenge with these APIs in treatments is that they are not soluble in water, thus they low absorption into the blood stream (bio-availability). The key to making these APIs more bio-available is to understand how they grow as crystals and drop out of the aqueous solutions. One of the ways these APIs were made more bio-available is to render them amorphous and suspend them in an aqueous solution. After suspension in solution, the concentration of the API in the solution was measured every ten seconds while a seed crystal of the API was being rotated by a rotating disk apparatus (RDA). The data collected was then analyzed to see if at faster rotational speeds, the crystal growth rate would reach a maximum. This analysis will determine if there is a region where the drug's growth is not limited by diffusion; it will help us with future experiments which include adding different cellulose based polymers to inhibit the integration of crystal growth molecules.