

CMCC *Mechanochemistry Discussions*

Online Seminar Series

Developments in Large Scale Mechanochemical Synthesis

Livestreaming at
10:00 AM (CT)

THURS., September 16, 2021

on the CMCC YouTube Channel:
<https://www.youtube.com/channel/UC7eCYPKbGTKpgO7W2bNABxg>

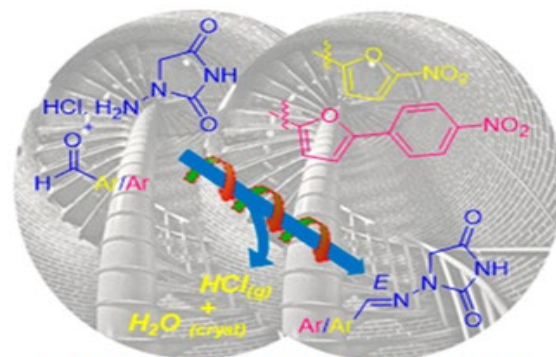


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ABSTRACT: We have demonstrated that twin screw extrusion (TSE) can be employed for the scale up of mechanochemical synthesis into a continuous, solvent-free process.¹ The excellent potential of extrusion has been demonstrated via the preparation of metal organic frameworks, deep eutectic solvents, and a library of organic compounds. Extrusion allows the preparation of these materials on a 6.5 kg_{hr}⁻¹ scale and the residence time is very short (2 minutes). Furthermore, Active Pharmaceutical Ingredients (APIs) have been successfully synthesised by extrusion² and they have been actively rendered amorphous by manipulation of the extrusion parameters. More recently, we have demonstrated the preparation of organic compounds of pharmaceutically relevant co-crystals by solid state sonochemistry, particularly by using a common ultrasonic cleaning bath.



Continuous Manufacturing of APIs

References:

1. Crawford, D. E. and Casaban, J.; Recent Developments in Mechanochemical Materials Synthesis by Extrusion. *Adv. Mater.* **2016**, *28*, 5747–5754.
2. D. E. Crawford, A. Porcheddu, A. S. McCalmont, F. Delogu, S. L. James and E. Colacino, Solvent-free, Continuous Synthesis of Hydrazone-based Active Pharmaceutical Ingredients by Twin-Screw Extrusion, **2020**, *32*, 12230.



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