



IFPRI Project Abstract

Development of innovative tools to characterize the drying of wet powders under shear

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Project Start Date: 01/01/2023

Abstract Date: 25/05/2023

Project Objective:

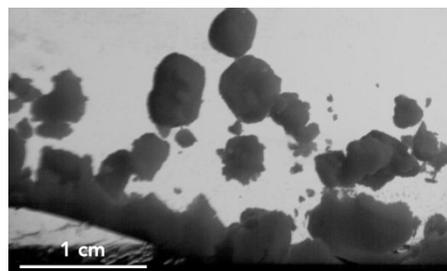
The main objective of this project is to characterize how the methods of drying a mixture of particles and liquid affect the state of agglomeration of the final dried product, particularly through the influence of shear. The project is based on the development of experimental tools that will allow easy implementation and testing of different powders and liquids while controlling the input energy and/or shear rate during the drying process.

Approach:

This experimental project aims at developing new small-scale tools for studying the drying of wet powders with shear and characterizing the time evolution of the agglomerates during the drying process. The first part is to develop an oscillating box experiment where the powder and the liquid will be introduced before letting the mixture dry by providing shear through oscillations of the box. The second part will consist of developing a rotating drum (medium shear) where the humidity and temperature could also be controlled during the drying process.

Recent Results:

- Development of the oscillating system (mechanical shaker, quasi-2D transparent box) and preliminary tests with model glass beads and water to probe the role of acceleration and amplitude of oscillation. Study of the average time evolution of the aggregate without moisture exchange.
- Started developing a custom-made rotating drum experimental setup



Next Steps:

The next steps in this project are to:

- design an air exchange mechanism in the oscillating box system to allow air to circulate inside (control of temperature and humidity) without having any leakage of powder.
 - do some first tests with model powders provided by members of IFPRI (GCC/PCC, Quartz, etc.)
 - design humidity and temperature exchange in the rotating drum setup
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