



Topical Research Meeting on Physics in Food Manufacturing

Session: Ingredients

A physicists approach to a coffee Brewing control chart

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The Coffee brewing control chart has been widely used to describe the region of ideal coffee brewing for some 50 years. However a chart is needed that connects actual extraction conditions (flow rate, brew time, grind....) to yield and strength outcomes - in contrast to the current one that just plots the outcomes. The poster will describe the basic physics of brewing from a bed of packed coffee grains and will present a simple physical model based on diffusion of soluble species out of a distribution of particles. This applies modern simulation techniques for multi-particles to build on older single particle diffusion models (1,2). It will be validated against experiment. It will predict a new approach to presenting brewing control charts, one with brew time and a reduced extraction rate as control parameters. An example will be given for coarse grinds. From this chart yield, volume and strength of a brew can be read off at will, under a wide range of brewing conditions. The talk will further present how experiment and modelling can be applied to the dynamics of flavour development during brewing.