Value of Information Analysis in Product/Process Design

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Abstract
We propose a generic optimisation-based formulation for the integrated design of chemical products and respective processes, driven by product quality factors, and incorporating both model and parameter uncertainties. Different problem levels are discriminated and the value of eliminating their associated uncertainties is also evaluated. This value of information analysis may greatly support product/process development, indicating priorities for further research. A cosmetic lotion case study illustrates the proposed methodology and concepts, with the prediction of aqueous phase viscosity being identified as the key aspect for further solution refinement.

Keywords: Product design, process design, uncertainty, value of information.