# Computational and Theoretical approach of the microstructure generation of the liquid state thin film by the drying phenomena

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Coating process is the key process to make the product versatile via applying special solution to the surface of product to make thin film. It is composed of liquid applying process and drying or solidification process. The performance of the final product is determined by the microstructure of the dried film which is affected by the drying process. Previous researches developed the model combining conventional mass transport concepts to depict early drying regime, but their model is based on the empirical analysis rather than the rigid thermodynamic concepts. It may describe the simple case of early drying regime, but it may go through transformation or addition of several factors to illustrate regime. In the present study, we attempt to suggest analysis method of early drying regime in the way of the thermodynamic approach and the variational calculus and find the parameters governing the system to induce favorable microstructure.