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Characterization of dry powder inhalation systems using an organic solvent to reach special micrometric properties

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Pulmonary drug delivery represents a new alternative treatment way for both local and systemic diseases (where, in addition to its beneficial properties, one-tenth of the active ingredient is sufficient to achieve the required effect by oral administration [1]). To accomplish this, the international literature distinguishes between nebulizers, pressurized metered-dose inhalers, and dry powder inhalers (DPIs). The development of the latter can be considered a "hot topic" these days, due to a large number of formulation options available. A number of solid excipients are being tested for their effect on aerosolization [2], but not a lot of data are currently available on the aerosolization effect of organic solvents (OSs) used in DPI sample preparation [3]. Thus, the purpose of the present work was to investigate the effects of a given OS in different concentrations on powder properties and *in vitro* lung model results of DPI formulations, and to develop the microcomposites for pharmaceutical form prepared in the ideal percentage of OS using different DPI capsule types in stability test. The study showed that the percentage of the OS of our choice during spray drying production influences the physical properties of the samples and thus the aerosolization. As a result of the formulations development for pharmaceutical form made in the optimal percentage of the applied OS, remarkable differences in the stability investigations were found through various DPI capsule properties.

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