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HIGH THROUGHPUT PROCESS OF OPTIMISATION OF PIGMENT CONCENTRATES

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Abstract:

Preparation of printing ink is a complex and time consuming task and, as the number and range of possible components and concentrations increases, the number of test formulations multiplies. In addition, pigments such as carbon black can come in many forms and conditions, adding to the complexity of formulation. The first step in preparation of inks is the preparation of pigment concentrates. This involves particle size reduction, dispersion and stabilisation of pigment which is accomplished by milling or grinding the sample. Conventionally, (at the laboratory scale) equipment such as ball mills and re-circulating bead mills are used to breakdown aggregates/agglomerates and disperse the pigment. These mills usually require both a minimum sample volume (50 ml (1.7 oz)) and considerable amount of time in disassembly and cleaning after use. Automaxion provides a unique, patented system based on planetary milling which allows several small samples of 1 to 50 ml (0.03-1.7 oz) to be milled and dispersed in ordinary glass vials. Up to eight samples of 10 ml (0.34 oz) each can be processed at the same time. The ability to process many samples at the same time and eliminating the need to clean a mill considerably speeds up the formulation screening and investigations. In addition, smaller sample volumes make the optimization process economical and produce less waste. The use of the Automaxion mill to prepare multiple pigment concentrates at the 10 ml (1.7 oz) scale is critically discussed in the presented paper. It has been shown that the samples with comparable rheological profiles as those obtained using a standard laboratory re-circulating mill can be prepared.

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