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(54) Title: FEEDBACK-CONTROLLED AUTOMATED NANOPARTICLE SYNTHESIS

(57) Abstract: Herein disclosed is a system operable to synthesize nanoparticles, which includes a robotic module comprising: a temperature controller; one or more dispensers operable to dispense different reagents; and an extraction device; a reaction vessel configured to receive the different reagents from the one or more dispensers to form a reaction mixture from which the nanoparticles are synthesized; and a process control module operably coupled to the robotic module and a spectroscopy module, wherein the process control module configures: the extraction device to withdraw a sample of the reaction mixture at an interval as the reaction mixture progresses and to transfer the sample into one or more cuvettes of the spectroscopy module, and the spectroscopy module to generate spectral data based on an optical property of the sample and from the spectral data identify a condition which serves as a feedback to the process control module to configure: the temperature controller to change or maintain temperature of the reaction mixture as the reaction mixture progresses, the one or more dispensers to change or maintain a frequency and/or time and/or an amount of each different reagent dispensed into the reaction mixture as the reaction mixture progresses, and the extraction device to change or maintain the interval for withdrawing further samples of the reaction mixture to provide the feedback continuously to have the process control module configure the temperature controller, the one or more dispensers, and the extraction device, in aforesaid manner until synthesis of the nanoparticles in the reaction mixture is completed. Also, herein discloses a method of synthesizing nanoparticles using the system.



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