Can We Directly Measure Each Solute Concentration in Mixed Solution? A New Class of Polarimeter

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In this research, we present for the first time a new method to measure directly the concentration of different solutes present in a mixed solution in conjunction with a polarimeter. The key aspect is to use the specific rotation ratio changes in solution when using polarimeter that can be tunable depending upon the wavelength of the laser source. A new class of polarimeter was first designed by combining more accurate tuning of the minimum rotation angle, automation the polarizing plate, and coding a program for data analysis. Each solute in a mixed solution, for example, sucrose, fructose, maltose and lactose in an aqueous solution, showed different specific rotation ratio values in relation to the laser wavelength used. Hence, by solving a simultaneous equation, the concentration of each solute can be measured accurately, precisely and conveniently. We envision to employ this new method in a wide spectrum of research fields, including but not limited to medicine, food, and medical science.

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