World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:12, No:08, 2018

Characteristics of Oil-In-Water Emulsion Stabilized with Pregelatinized Waxy Rice Starch

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Abstract : Characteristics of pregelatinized waxy rice starch (PWR) gelatinized at different temperatures (65, 75, and 85 °C, abbreviated as PWR 65, 75 and 85 respectively) and their emulsion-stabilizing properties at different starch concentrations (3, 5, 7, and 9%) were studied. The yield stress and consistency index value of PWR solution increased with an increase in starch concentration. The pseudoplasticity of PWR 65 solution increased and that for both PWR 75 and 85 solution decreased with an increase in starch concentration. Small angle X-ray scattering (SAXS) profiles analyzed by Kratky Plot indicated that PWR 65 is natively unfolded particles while PWR 75 and 85 are the globular particles. The characteristics of emulsions stabilized with PWR were influenced by the temperature of gelatinization process and starch concentration. Elevated concentration of starch decreased the value of yield stress and increased the consistency index. PWR 65 produce stable emulsion to creaming at starch concentrations more than 5%, while PWR 85 is able to produce stable emulsion to both creaming and coalescence of droplets.

Keywords : emulsion, gelatinization temperature, rheology, small-angle X-ray scattering, waxy rice starch
Conference Title : ICFSN 2018 : International Conference on Food Science and Nutrition
Conference Location : Paris, France
Conference Dates : August 27-28, 2018