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Acid Hydrolysis and Optimization Techniques for Nanoparticles Preparation: Current Review

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**Abstract:**

Nanostarch is unique in that it is highly soluble, thermally stable, non-toxic and inexpensive. Hence, it is utilized in numerous well-established applications, including drug delivery, cosmetics, textiles, foods, and enhanced oil recovery (EOR). These applications take advantage of the special functions that can be achieved through modifications to the structure and properties of native starch. The most common method for the preparation of nanostarch with a relatively higher crystallinity and stability is acid hydrolysis. Technically, the properties of nanostarch are highly dependent on several factors during the hydrolysis process, such as the acid, concentration of acid, reaction time, reaction temperature, and source of starch. The production of nanostarch with desired properties requires a detailed understanding on each of the factors as they are inevitably affected the physical and chemical properties of nanostarch. Hence, it is vital to incorporate optimization technique into the production process to achieve the full potential of nanostarch. Therefore, the current review comprehensively elaborates on the factors that affect acid hydrolysis as well as the optimization techniques used in the preparation of nanostarch.