

幾丁質在鹼性水溶液系統中的溶液性質

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2023/04/26

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摘要

幾丁質因含有大量的分子間和分子內氫鍵，形成高度有序的晶體結構，導致不溶於常見的水性溶劑，目前已知可溶解幾丁質的溶劑有，鹼性溶劑(NaOH/尿素、KOH/尿素)、離子液體(ionic liquid solvent, ILs)、深共熔溶劑(deep eutectic solvents, DES)，有機溶劑(LiCl/DMAc)、氯化鈣/甲醇，然而有些液體並不適用，例如：LiCl/DMAc 溶液溶解效率低且具有毒性、氯化鈣/甲醇系統的高黏度，離子液體成本高，而近期 NaOH/尿素、KOH/尿素受到了關注。單寧酸為水溶性的多酚基團，為氫鍵的提供者，利用單寧酸的酚基與幾丁質的羥基形成氫鍵，促進幾丁質的溶解。本研究探討幾丁質溶解於 NaOH/尿素、KOH/尿素、NaOH/單寧酸、KOH/單寧酸中，進行冷凍解凍循環三次，探討最適溶解條件、溶解性質及溶解度。結果顯示，最佳解凍溫度及解凍時間為 23 °C 下在第三次解凍時間為 30 分鐘。2% α -chitin 溶解於 10%Na/0.1%TA (10% 氫氧化鈉/0.1% 單寧酸)、10%K/0.1%TA (10% 氫氧化鉀/0.1% 單寧酸)、10%Na/4%U (10% 氫氧化鈉/4% 尿素)、10%K/4%U (10% 氫氧化鉀/4% 尿素) 溶解度分別為 99.83%、99.80%、98.66%、97.95%；1% β -chitin 溶解於 10%Na/0.1%TA、10%K/0.1%TA、10%Na/4%U、10%K/4%U 溶解度分別為 98.58%、98.31%、94.53%、87.19%。綜合上述結果，由 10%Na/0.1%TA 溶劑溶解幾丁質為最佳，表明添加單寧酸組別溶解度比尿素組別高，NaOH 組別也優於 KOH 組。

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