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學號	486446050
研究 生(中)	戴志全
研究 生(英)	Chih-Chyuan Tai
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其他 題名	
指導 教授 (中)	陳焜堂
指導 教授 (英)	John T. Chien
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摘要(中)	<p>不相容的澱粉與多醣類分子會相互排擠，造成自分子聚集而加速澱粉老化。因此提高澱粉與多醣類之相容性，則可改善含澱粉食品品質及物性性質。本研究擬將高親水性之蔗糖酯（P-1670）與高直鏈玉米澱粉（HylonVII）複合，探討複合後所造成裸露之蔗糖基是否增加在水溶液中與關華豆膠分子外端分支接觸的機會，以及提高 HylonVII與關華豆膠之相容性。實驗以玻璃轉化溫度（Tg）變化來評估兩成份之相容程度，亦透過失水率和黏度分析來了解相容性對膠體結構之影響。示差掃描熱分析（DSC）的結果顯示，HylonVII於 79.9°C、複合物在 97.3°C 及關華豆膠於 56.6, 68.4 和 97.8°C 呈現 Tg。HylonVII-關華豆膠混合膠體雖在 66.7°C 仍</p>

存在關華豆膠的 Tg，但原 HylonVII 的 Tg 已消失。反觀複合物-關華豆膠混合膠體，不但原成份的 Tg 消失，且在 80.4°C 另出現異於原成份的新 Tg。以動態機械分析 (DMA) 亦發現，HylonVII 或複合物與關華豆膠之混合膠體分別在 92.2°C 和 104.5°C 均出現新 Tg。原成份的 Tg 雖然存在，但其 $\tan \delta$ 的波峰高度均已下降，顯示因混合後各成份分子間，因部份相容所造成交互作用，而降低分子移動之體積分率。故由 Tg 分析結果可知 HylonVII 或複合物與關華豆膠均呈現部份相容，且複合物與關華豆膠之相容程度高於 HylonVII-關華豆膠混合膠體者。各樣品在 Tg 以下溫度均發現 sub-Tg 及 sub-Tg 焓，其成因可能與聚合物側鏈分子之移動性有關。膠體於 90±2°C 之失水率分析發現，關華豆膠之添加可降低 HylonVII 及複合物的失水率，顯示兩相容之成份可明顯改善混合膠體之保水性。但複合物-關華豆膠混合膠體之失水率高於 HylonVII-關華豆膠混合膠體者，這可能與 HylonVII 和蔗糖酯複合後的水合體積改變有關。HylonVII、複合物、關華豆膠及其混合膠體貯存前、後，於 25.5±0.1°C 的之視黏度依序均為：HylonVII-關華豆膠混合膠體>複合物-關華豆膠混合膠體>關華豆膠>複合物>HylonVII。且 HylonVII 或複合物與關華豆膠混合膠體之視黏度均高於其個別成份視黏度之加成。由此可知，兩部份相容成份之混合可提高混合膠體之視黏度。此與失水率分析之趨勢相同。各膠體經貯存 1 天後的視黏度均高於未經貯存者，顯示膠體強度會因貯存而增強。各膠體溶液的 n 值均介於 0 與 1 之間 (0<n

摘要
(英)

Incompatibility between starch and polysaccharide may result to form self-aggregation of individual molecules in an aqueous solution, and lead to retrogradation of starch. The quality and physical properties of starch-containing foods were thus degraded. This could be improved by increasing compatibility between starch and polysaccharide. Complex formation of sucrose ester and starch was also commonly used to retard starch retrogradation. It was of interest to investigate whether the complex may also increase compatibility between guar gum and HylonVII, amylo maize starch with 58.8% amylose content. In this study, compatibility of two components was investigated by changes in glass transition temperatures (Tg). Water loss and viscosity analysis can subsequently be used to monitor the influence of compatibility on the gel. Results of differential scanning calorimetry (DSC) showed that HylonVII and the complex appeared glass transitions at 79.9°C and 97.3°C, respectively, whereas, Tgs for guar gum were at 56.6, 68.4, 97.8°C. The HylonVII-guar gum mixture, appeared Tg at 66.7°C, which was close to the Tg of guar gum, however, the Tg of HylonVII was disappeared. On the other hand, the complex-guar gum no longer showed the Tgs of two individual components, and exhibited a new Tg at 80.4°C, which was significantly different from the Tgs of two individual components. Similarly, results of dynamic mechanical analysis (DMA) appeared a new Tg at 92.2°C and 104.5°C for the HylonVII-guar gum and complex-guar gum mixture, respectively. Although the Tgs of individual the components were still appeared in the above mixtures, the heights of $\tan \delta$ peaks declined. Above evidence implies that interaction, which led to close contact between two partially compatible molecules in a mixed gel, decreased the volume fraction of the relaxing phase. Both

	<p>HylonVII and the complex were partial compatible with guar gum, and the complex-guar gum mixture shows higher compatibility than the corresponding HylonVII-guar gum mixture. All the samples appeared the sub-Tgs and sub-Tg endotherms below the corresponding Tgs. The sub-Tg relaxation may relate to side-chain relaxation of a polymer. Addition of guar gum decreased water loss of HylonVII and the complex, while being heated at $90\pm 2^{\circ}\text{C}$. This result indicates that water holding capacity of a mixed gel was significant improved by mixing two compatible components. Water loss of the complex-guar gum mixture was higher than that of the HylonVII-guar gum mixture. This was due to change in hydrodynamic volume for the complex. Apparent viscosity of above samples at $25.5\pm 0.1^{\circ}\text{C}$ were as follows: the HylonVII-guar gum mixture > the complex-guar gum mixture > guar gum > the complex > HylonVII. Apparent viscosities of the HylonVII-guar gum and complex-guar gum mixtures were higher than the sum of viscosities of individual components. This result shows that apparent viscosity increased with mixing two compatible components. Apparent viscosity of the HylonVII-guar gum mixture was higher than that of the complex-guar gum mixture. Viscosity results were consistent with those of water loss. After one day of storage, all the gels showed higher apparent viscosities than those of no storage. It means that the gel strength increased during storage. All the mixtures showed pseudoplastic behavior ($0 < n$)</p>
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