

35. Acetylation of Polyvinyl Alcohol and Deacetylation of Polyvinyl-acetate

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Acetylation of polyvinyl alcohol and deacetylation of polyvinyl acetate with acetic acid-water have been investigated using hydrochloric acid as a catalyzer. It has been found, as shown in this following table, that from the both side of the reaction i. e. acetylation of polyvinyl alcohol and deacetylation of polyvinyl acetate, the same degree of acetylation can be attained so far as the ratios of acetic acid to water remains constant.

Acetylation of polyvinyl alcohol and deacetylation of polyvinyl acetate at 40°C.						
Composition of the reaction medium	Water	vol %	50	32	24	17
	acetic acid	vol %	50	68	76	83
Equilibrium degree of acetylation in mol. %.	by acetylation		22.0	39.8	49.6	60.0
	by deacetylation		22.5	39.3	51.3	61.6

The reaction proceeded in a homogeneous system and equilibrium constant can be calculated from the above data.

36. On the Drawing of Polyvinyl Alcohol Filaments

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Polyvinyl alcohol mono-filaments have been prepared by semi-melt spinning process from concentrated aqueous solution. The mono-filaments have been stored and aged under various conditions and drawn at 50°C and 100°C. The swelling properties of the drawn filaments have been measured.

Degree of swelling decreased with increasing drawing. When water content of filaments is higher, the effect of temperature of drawing on the swelling is less remarkable. In the case of aging in closed vessels, the effect of aging is more remarkable by the drawing of lower degree. After 24 hrs. the duration of aging shows practically no effect on swelling. The optimum condition to obtain filaments of minimum swelling are as following: aging <1 hr., drawing at 100°C. Degree of swelling in water at 30°C is about 40 % of the dry weight.

Viscosity of dilute aqueous solutions of drawn filaments have been also determined. It is noteworthy that the intrinsic viscosity increases with increasing