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論 文 内 容 の 要 旨

The purpose of this study is to investigate the possibility of developing comfortable underwear using PP. Polypropylene fiber (PP) has the characteristics required for comfortable underwear, such as low thermal conductivity, low Young's modulus, hydrophobicity and light weight. But PP has not been used as a garment material for safety reasons. So, there is little data on PP as a clothing material, and its use method is unknown. Nowadays, an insoluble stabilizer has been developed and the safety issue has been resolved

In Chapter 2, the effect of blended fiber materials on knitted fabric using PP blended yarn was investigated by material property evaluation. In blending PP and other various fiber materials with same cotton yarn number, PP tended to encourage lower apparent density, lower thermal conductivity and the lower recoverability. By blending PP and water-absorbing and quick-drying fiber such as MCPET, the knitted fabric could be designed for underwear with high heat-retention performance and high water transportability.

In Chapter 3, a wearing comfort evaluation by wearing experiments was carried out on underwear using the knitted fabric prepared in Chapter 2. The influence on wearing comfort of blended fiber materials was captured from clothing microclimate relating water transport property and skin contact feeling relating to surface property. The high water transportability quickly reduced discomfort after sweating, and reduced wearing stress, so that it did not

encourage sympathetic nerve activity. By combining hydrophobic PP and water-absorbing and quick-drying fiber, underwear could be designed with low wearing stress due to high heat-retention performance, good texture and high water transportability.

In Chapter 4, for the purpose of investigating the suitable blending ratio, the knitted fabrics for underwear were prepared using blended yarn made of PP and cotton with blending ratio changed stepwise, and material property of these fabrics were evaluated. The blending ratio with PP25%-Cotton75% was closed to the suitable value because water transportability and heat retention performance was added without spoiling cotton's characteristic. It was considered that the optimal value can be identified by investigating the blending ratio in the vicinity of PP25%-cotton75%.

Basic data was gathered for design of comfort underwear with high heat retention, high water transportability and good texture, and the two methods of utilizing PP as underwear materials were found out.