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Changes of structure and properties in physical aging of polycarbonate TOSHIAKI OUGIZAWA, HISASHI JUFUKU, KAI HAYASHI, Tokyo Institute of Technology — Changes in amount of enthalpy relaxation and tensile properties with physical aging were measured in polycarbonate (PC) which is one of typical glassy polymer. PC annealed at the slightly lower temperature than T_g showed endothermic peak above T_g in DSC measurement and more brittle behavior in tensile measurements. And PC annealed at 30°C lower temperature than usual T_g showed 2 T_g and volume expansion in initial stage of annealing. After that the sample showed usual physical aging behavior as shown above. By contrast, it was found that the PC annealed at temperature (60°C or less) much lower than the T_g did not show those behaviors and new endothermic peak at temperature much lower than the T_g was observed. Based on these results, it was considered that the metastable structure, which was formed by annealing glassy polymer at temperature much lower than the T_g , suppresses the appearance of endothermic peak above T_g and the lowering of the mechanical properties by physical aging.

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