The thin films of miscible Polybutylene adipate)/Polyvinyl chloride (PBA/PVC) 6/4 blend under uniaxial drawing behavior was studied by wide angle X-ray diffraction (WAXD), small angle X-ray scattering (SAXS) and grazing incidence wide angle X-ray scattering (GIWAXS). We study crystals orientation of polymorphic PBA crystals through different draw ratios. The polymorphic phase transition of PBA only depends on temperature and it does not change under strain. The c-axis parallels to the stretching direction at low drawing ratios on both PBA crystals of alpha- and beta-cystals. In contrast, the b-axis of the PBA alpha-crystal was oriented parallel to the stretching direction and the a-axis of the PBA beta-crystal was oriented parallel to the stretching direction at high drawing ratios. Figure 1 Models of PBA/PVC blend under drawing crystallization: (a) PBA alpha-crystal and (b) PBA beta-crystal.

Keywords: thin film of polymer, crystals orientation, crystallization under tension

Crystals orientation of polybutylene adipate/polyvinyl chloride blend under uniaxial drawing
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As an energy carrier, hydrogen is a very clean fuel without greenhouse gases, ozone layer depleting chemicals, acid rain ingredients and pollution. Sodium borohydride (NaBH₄) can be used as a hydrogen storage medium due to high hydrogen storage capacity (10.8%wt). NaBH₄ in aqueous alkaline solution generates hydrogen and sodium borate (NaBO₂) as by product contact with catalyst according to the hydrolysis reaction which is known to run via zero order kinetics. In the present study, Ru-LiCoO₂ catalyst has been manufactured to generate clean hydrogen from NaBH₄. Nano-sized ruthenium (Ru) dispersed on the LiCoO₂ surface by washing process to prepare the catalysis for NaBH₄ hydrolysis. The catalyst is characterized by scanning electron microscopy including EDX analysis (SEM-EDX), X-ray diffractometry (XRD). EDX analysis shows the ~15wt. % Ru containing by the LiCoO₂, XRD patterns shows the Ru- LiCoO₂ catalyst display the characteristic peak of the LiCoO₂ structure. The analysis show Ruthenium particles coated the LiCoO₂ ceramics. A new study about the coating thickness has also been studied and the thickness of the Ruthenium coated on the surface of LiCoO₂ is measured.

Keywords: catalyst, ruthenium, lithium cobalt oxide