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## A NOVEL METHOD OF PREPARATION OF SOFT AND HARD POLYMER FILMS USING PVC COLLOIDS

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Polyvinyl chloride (PVC) is one of the most widely thermoplastic in the world. It's easily modified and its costs are low. But PVC is a hard material, difficult to shape and plasticizers and additives must be added to facilitate its processing. Therefore, the PVC products are usually complex mixture of PVC, plasticizer, and various additives. The properties of the products are influenced by each component of the formulation.

To overcome this problem we synthesized the core/shell PVC colloids by emulsion polymerization. By using the general method we prepared the polymer films based on core/shell PVC colloids. In our system, the kind of shell in the core/shell toughness modifier is found to be an important factor in the rigid polyvinyl chloride (PVC). Butyl acrylate (BA) is a specific monomer for PVC system. It has different mechanical properties with PVC.

After BA modified, the PVC surfaces were coating with a soft structure. The diameter of PVC core/shell particle was 200nm characterized using a laser Nicomp Submicron Particle Sizer in Fig.1. We prepared the PVC polymer films at 80 in oven and took the films to test. The mechanical properties of the PVC core/shell films was determined by tensile test with 5mm/min according to ASTM D256. The results were shown as Fig. 2.

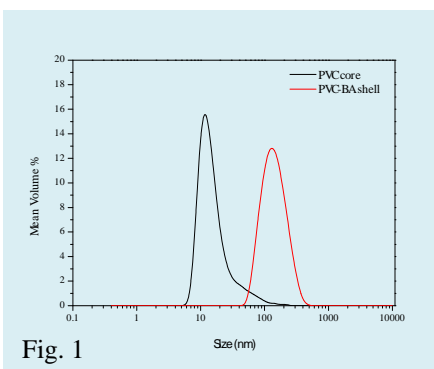


Fig. 1

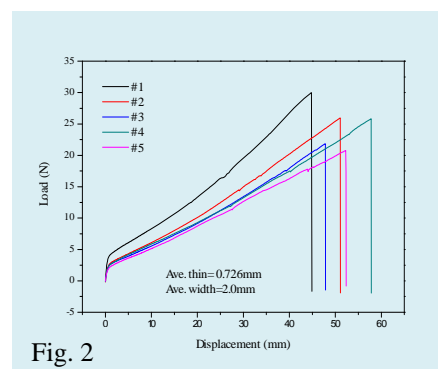


Fig. 2