# Supplementary Information

## Geometrical implication of ion transporters employing ellipsoidal hollow structure in oligomer electrolytes

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## Figures

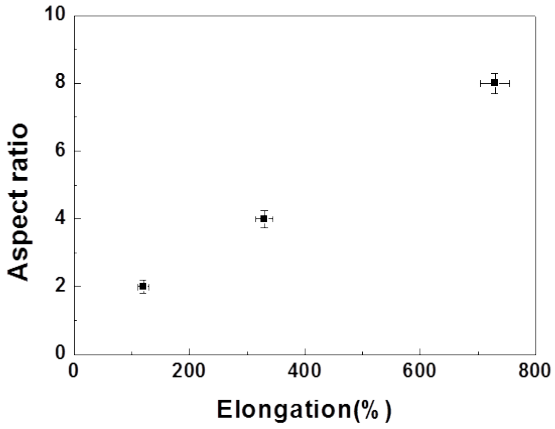


**Figure S1.** Aspect ratio of polystylene (PS) particles to degree of elongation for poly(vinyl alcohol) films containing PS particles.

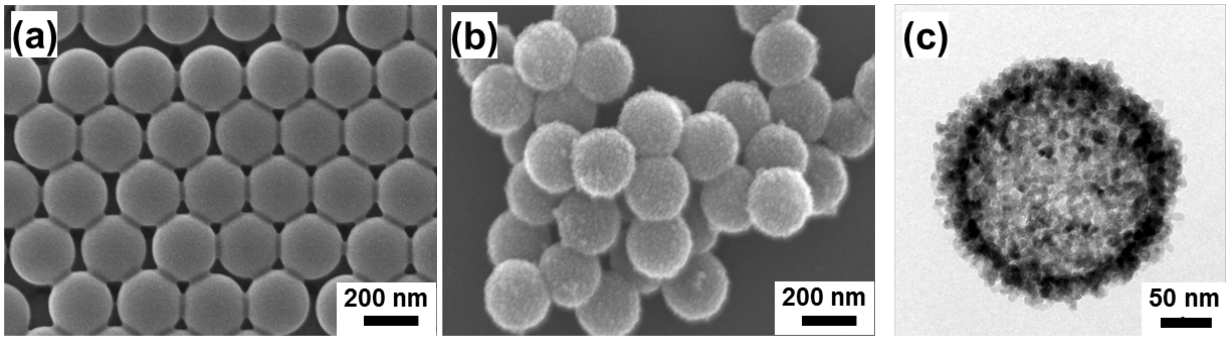


**Figure S2.** SEM images of (a) the pristine spherical PS particles and (b) the $TiO_2$ hollow spheres derived from formation of $TiO_2$/PS core-shell hybrid particles and subsequent removal of PS component. (c) TEM image of the $TiO_2$ hollow spheres.

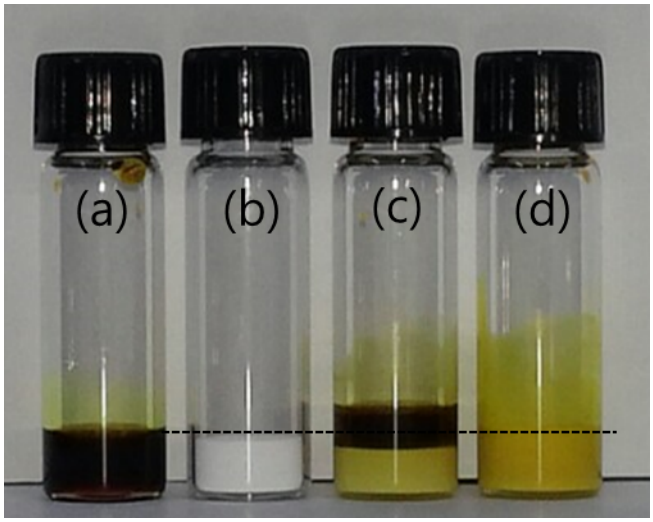


**Figure S3.** Photographs of (a) 0.9 g of oligomer electrolyte, (b) 0.1 g of $TiO_2$ hollow ellipsoidal particles, and composite electrolyte (c) prepared via pouring the oligomer electrolyte onto the hollow particles and (d) after complete mixing them. 0.1 g of $TiO_2$ hollow ellipsoidal particles has a comparable volume to 0.9 g of oligomer electrolyte. After mixing those components, the volume of the mixture hardly increases compared to that of the oligomer electrolyte.