It will be discussed in this work how it is possible to produce latex films by evaporation induced self-assembly (EISA) process. Latex spheres were synthesized in a cylindrical flask without N2 flow. The polymerization process of styrene happens at water as solvent and with the presence of persulfate potassium as initiator. The final product was a dispersion of spherical nanometric particles (d< 200nm) whose concentration can be changed from 0.5 to 10% (V/Vo). These dispersions were spread on glassy substrates at 50 °C over a square area (~1 cm) with control of solvent evaporation. The films are transparent and they show the formation of nanowire structures by scanning electron microscopy (SEM) characterization. Such structures were associated to high affinity of latex spheres particles to form cylindrical arrangements due to presence of O2 during their synthesis. It has been concluded that this self-assembly structure can be very worthy for generation of functional devices like sensors, solar cells and biomaterials.