

Decreasing particle size of a poorly water-soluble paclitaxel using polymer in fractional precipitation

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In this study, we have for the first time applied fractional precipitation with hydrophilic polymer in order to decrease the particle size of the anticancer agent paclitaxel from plant cell cultures. When compared with the case where no hydrophilic polymer was employed, the addition of hydrophilic polymer in fractional precipitation resulted in a considerable decrease in the size of the paclitaxel precipitate. The use of a polymer had an effect on inhibition of precipitate growth compared to prepared particles without polymer. Among the polymers used, HPMC 2910 was the most effective for inhibition of precipitate growth. In addition, a polymer concentration of 0.2 wt% yielded the smallest particle size. However, the particle size increased as the concentration of polymer increased to greater than 0.2 wt%. This result might be due to inhibiting an appropriate diffusion of the solvent toward the antisolvent (water) caused by the high viscosity of the solution containing polymer. Acknowledgment This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (Grant Number: 2015016271).