Efficiency Enhancement of Vancomycin Crystallization by Increasing the Surface Area of Reactor Using Ion Exchange Resin

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Crystallization is a simple, energy-efficient and environmentally friendly process for purifying vancomycin from fermentation broth. However, the crystallization process has been inherently problematic due to the lengthy crystallization time that is required. An improved crystallization process could significantly reduce the crystallization time by increasing the surface area available for crystallization. Vancomycin crystallization time was shortened compared to the control by increasing the surface area per working volume (surface area/volume of reaction solution, S/V) of the reacting solution through the addition of a cation exchange resin, an anion exchange resin. Most of the vancomycin could be obtained after about 12 hr of crystallization using Amberlite IR-120 (plus), Amberlite 200, Amberlite IRC-50, Amberlite IRA-400, and Amberlite IRA-910. Use of an ion exchange resin also resulted in the production of smaller vancomycin particles since it inhibited the growth of particles. Since high purity vancomycin can be obtained in high yield and the crystallization time can be reduced, this improved method is expected to significantly enhance the final purification process.