



**Figure 1.8** Continuous direct nucleation and crystallization on surface of polymer film process line scheme. Section 1: Excipient film preparation, Section 2: Continuous direct crystallization, Section 3: Roll-to-roll continuous product processing.



**Figure 1.9** Deposited crystals on the surface of the polymeric excipient film from a continuous process.

crystallization (heterogeneous) on the surface of the film travelling through the solution, and (3) the processing section (“downstream”). Figure. 1.9 shows the film surface after Section 2 where crystals formed on the surface of the excipient film. The control strategy for tuning the amount of crystal deposition on the surface area has been proposed by controlling the supersaturation ratio of the crystallization solution and also by residence time (linear velocity of the film through travels through the pool).

### 1.3.3 Agitated Vessel Type Crystallization Process

Agitation in crystallization vessels can be conveniently achieved using impellers in CSTs, but there are alternatives including airlift/draft tube/fluidized bed crystallizers, OBC, and Taylor–Couette crystallizers (TCC).<sup>26,29</sup> A typical CST configuration is shown in see Figure. 1.10.