

ABSTRACT

A method for plasticating and conveying macromolecular materials based on elongational flow and equipment thereof are disclosed. A set of spaces having specific shape is used, and the volume of the spaces can increase and decrease periodically, and the materials flow into the spaces when the volume is increasing; and are pressed, plasticated and discharged when the volume is decreasing, so that the plasticating and conveying process is mainly under normal stress. A vane-type plasticating and conveying unit mainly comprises a cylindrical hollow stator; a columned rotor eccentrically installed in the inner cavity of the stator, wherein a group of rectangular slots are formed along the circumference of the rotor; a plurality of vanes which are arranged evenly in the slots and baffles mounted on the two sides of the stator. The inner surface of the stator, the outer surface of the rotor, the two vanes, and the two baffles surround to form the spaces having specific shape. The vane-type plasticating and conveying unit and various screw-type extruding unit or various plunger-injection unit can be combined to form a vane-type plasticating and injection device of an extruder or injection machine. The present invention is of short material thermo-mechanical history, low energy consumption, wide adaptability, and small volume.

FIG. 1