

Novel temperature control in a microfluidic system

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Microfluidic system in chemical and biological applications has many advantages, but temperature control is still a critical issue. Usually temperature control is necessary to maintain the temperature at some level at some specific location or to realize high temperature for high temperature chemical reaction. In this work we propose two simple methods of temperature control in a microfluidic system. One is to realize high temperature using a screw type microfluidic system. We embedded a heating material inside a cylindrical rod and formed a microfluidic channel on the surface of a rod. The other approach is the use of thermoelectric device for the temperature control. By winding a flexible tube around a thermoelectric device the temperature of the flowing fluid can be changed periodically between high temperature and low temperature. Some applications of a screw type microfluidic system and a system with thermoelectric device will be discussed.