ABSTRACT

MINIATURIZED MULTI-CHAMBER THERMAL CYCLER FOR INDEPENDENT THERMAL MULTIPLEXING

It is often desirable to be able to perform an array of micro-chemical reactions simultaneously but with each reaction proceeding at a different temperature and/or for a different time. A classic example is the polymerase chain reaction associated with DNA analysis. In the present invention, this is achieved by means of an apparatus made up of a chip of plastic, or similar low cost material, containing an array of reaction chambers. After all chambers have been filled with reagents, the chip is pressed up against a substrate, typically a printed circuit board, there being a set of temperature balancing blocks between the chip and the substrate. Individually controlled heaters and sensors located between the blocks and the substrate allow each chamber to follow its own individual thermal protocol while being well thermally isolated from all other chambers and the substrate. The latter rests on a large heat sink to avoid temperature drift over time. A process for manufacturing the apparatus is also disclosed.

(FIG. 1 IS SUGGESTED FOR PUBLICATION)