Sensor Data Abstraction for Failure Prediction of Polymerase Chain Reaction Thermal Cyclers

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Received 18 July 2017; received in revised form 20 November 2017; accepted 26 November 2017

Abstract

In this paper, the heating and cooling rates of polymerase chain reaction thermal cyclers was analysed over time, to predict their aging. Two kinds of methods were applied to calculate the rise times of the heating and cooling protocol sections, which were inversely related to the heating or cooling rates. The temporal changes of the rise times were investigated over several months. For three thermal cyclers with different structures, the increases of the rise times were fairly linear; therefore, the aging prediction is feasible.

Keywords: PCR thermal cycler, maintenance, aging, failure

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