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具有温度补偿的小型生化分析仪温度控制系统的研究

作　者：周良1,2 ,黎海文1 ,吴一辉1*

单　位：1.中国科学院 长春光学精密机械与物理研究所 应用光学国家重点实验室，吉林 长春，130033 2.中国科学院研究生院，北京 100039

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摘　要：

小型生化分析仪的温度控制系统大多采用固体直热恒温系统。固体直热恒温系统采用加热片直接对反应盘加热，通过热传导对反应杯中的反应液加热，使其达到特定的反应温度。但是随着环境温度的改变，反应液会偏离特定的反应温度，影响生化测试结果精度。因此，温度控制系统需要对环境的影响进行补偿,使得反应液稳定在特定的温度。本系统通过改变反应盘的温度来补偿环境温度的影响。实验证明，本论文提出的补偿方法能使反应液温度控制在37℃，其正确度为±0.3℃，波动±0.1℃，完全满足生化分析对恒温系统的要求。

关键词：小型生化分析仪；温度补偿；铂电阻测温电路；ICL7135；自适应PID

biochemical analyzer capable of temperature compensation

Author's Name: ZHOU liang1, 2 LI Hai-wen1 WU Yi-hui1*

Institution: 1. The State Key Lab of Applied Optics, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033,China; 2. Postgraduate Institute of Chinese Academy of Sciences, Beijing 100039,China

Abstract:

Mini-clinical biochemical analyzer usually uses dry bath temperature controlling system, where the container of reaction cup is heated directly by heater and the liquid sample is heated through thermal conductivity, thus the liquid sample will maintain at target temperature. If ambient temperature changes the temperature of the liquid sample will deviate from the target temperature and this is not good for biochemical measurement. Therefore, it is necessary to compensate the influence of ambient temperature actively. The temperature controlling system in the paper changed the temperature of the container actively to compensate this influence. The experiments showed that the temperature of liquid sample was 37℃, and it's correctness was ±0.3℃and it's fluctuation was ±0.1℃, and this method was available for the mini-clinical biochemical analyzer .

Keywords: mini-clinical biochemical analyzer; temperature compensation; Pt resistance temperature measurement circuit; ICL7135; adaptive PID algorithm

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