

Seebeck效应的参数测定及其应用

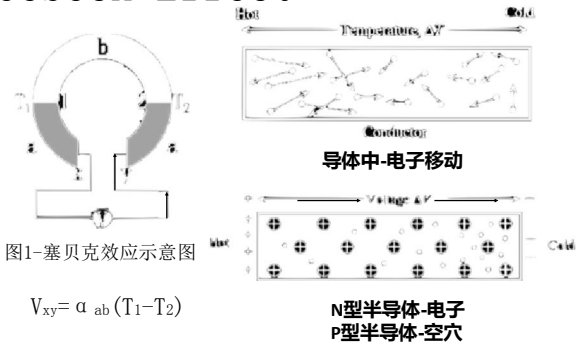
The study and tentative applications of the Seebeck effect

理科试验班
谢尧辰 刘雨萌
2015年6月

ABSTRACT

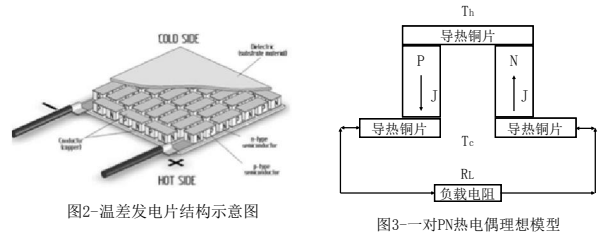
- I. Brief introduction of the Seebeck effect
- II. Two experiments we designed to measure the parameter of the commercial SP1848-27145 thermoelectric generators
- III. Three tentative applications of the Seebeck effect

Seebeck Effect

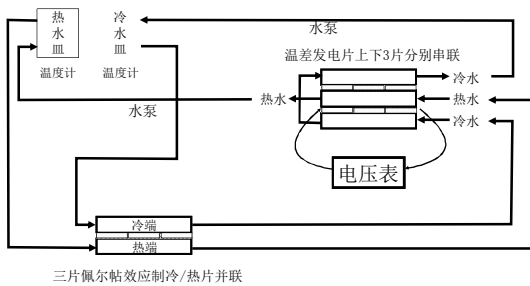


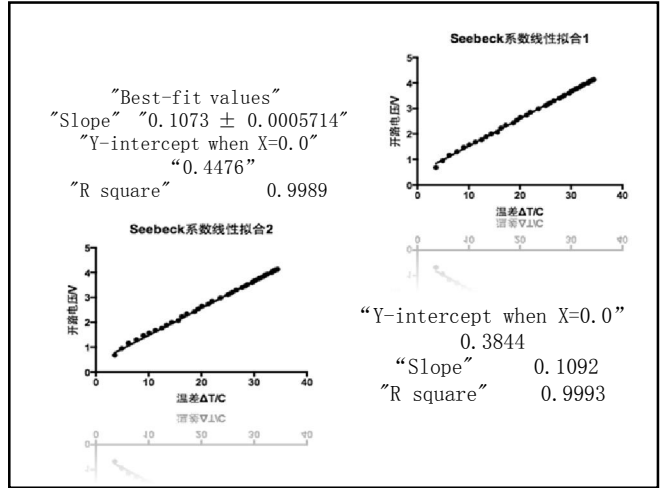
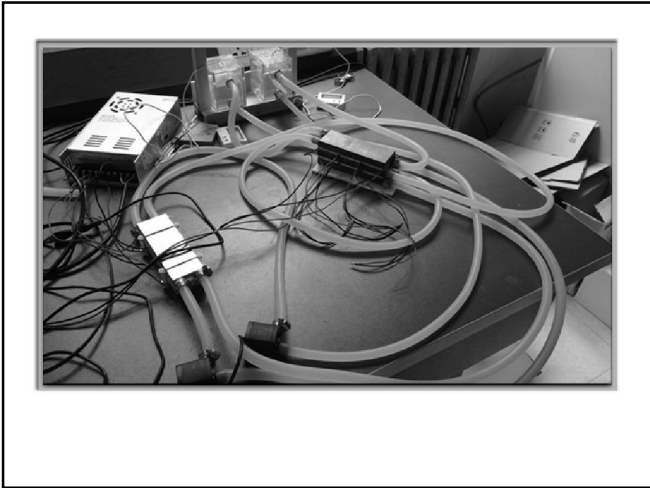
Seebeck coefficient

先考虑由一对PN热电偶构成的理想模型



Schematic



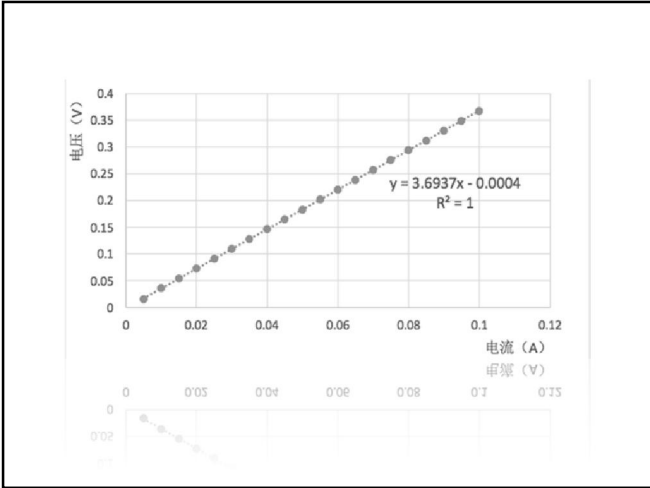


$k=0.1092$
 $\alpha = k/3n$
 $\alpha = 2.86 \times 10^{-4} \text{ V/K} = 286 \mu\text{V/K}$

方程不过原点

Resistance of the thermoelectric generators

*the less resistance,
 the more current can flow*



APPLICATIONS

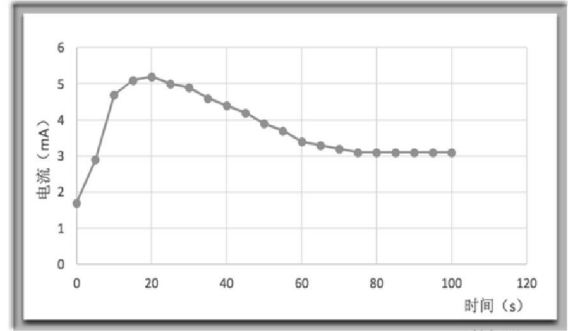
- Human power generation
- Thermoelectric generator cup
- Thermoelectric recovery of waste exhaust heat

Human power generation

Using the temperature difference between you and the environment to yield electricity



电流随时间变化曲线

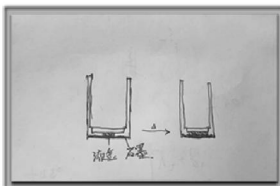
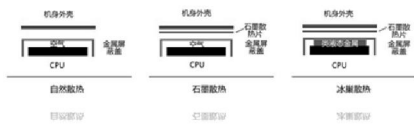
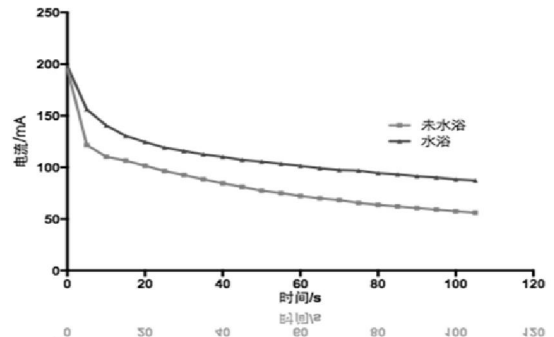


Thermoelectric generator cup

The heat from hot water, can we utilize it for generating electricity?

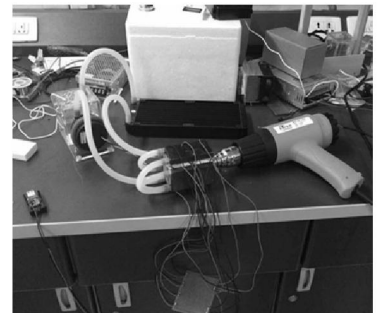


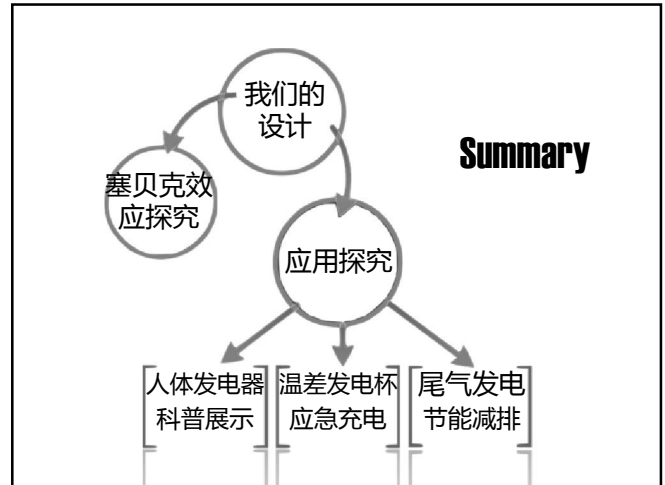
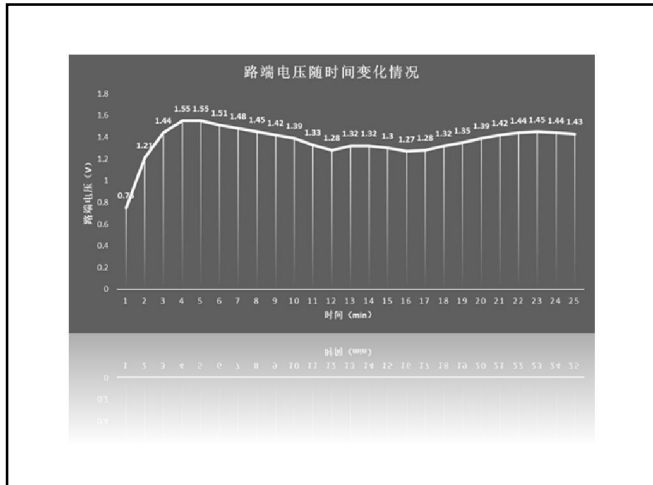
电流随时间变化曲线



Thermoelectric recovery of waste exhaust heat

One way of regenerating exhaust waste heat that has been under development for some years is the use of thermoelectric generators based on the Seebeck effect.





致谢

感谢秦敢老师、张增明老师的指导

感谢韦先涛老师在完善实验方案、制作试验装置时提供的宝贵帮助！

感谢郑智阳、王睿秦、高翔、肖伟

实验由温差发电小组共同努力合作完成。

Thank you!