

# 弗兰克赫兹实验汞 $6^3P_0$ 能级测量

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- ▶ 数据处理
- ▶ 模型假定
- ▶ 理论结果
- ▶ 数据支持



$$\text{Lg}(P/Pa) = -\frac{-3200}{\frac{T}{K}} + 10.125 \quad (1)$$



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- ▶  $T = 180^\circ\text{C}$ 时, 有 $\lambda = 0.03\text{nm} \ll 5\text{mm}$

$$U_n \approx U_0 + nU_a \quad (3)$$

# Theoretical Prediction



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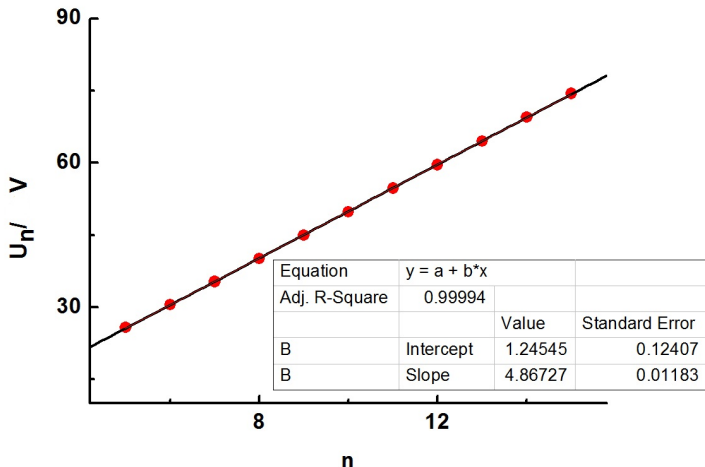


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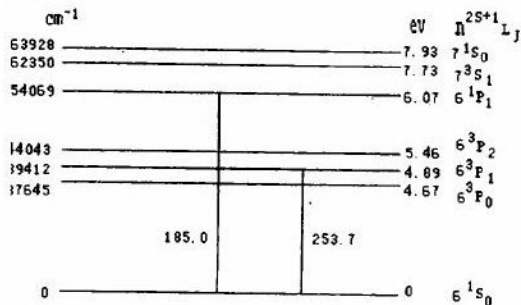
- ▶  $T = 180^\circ\text{C}$ 时, 有 $\lambda = 0.03\text{nm} \ll 5\text{mm}$

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180°C的 $I_p - V_{G2k}$ 曲线对峰位 $U_n$ 和序号 $n$ 直线拟合。



# Not the Lowest One

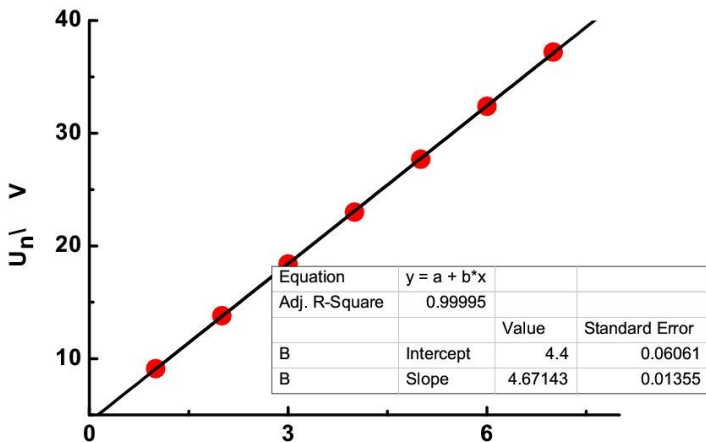


$6^3P_1$ 能级激发电位4.89eV

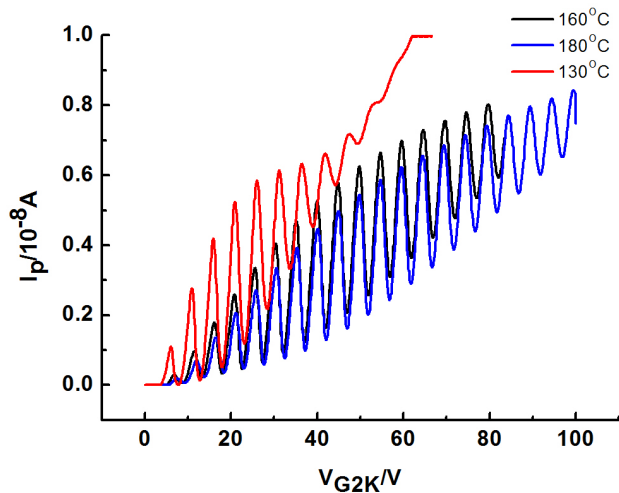
$6^3P_0$ 能级激发电位4.67eV



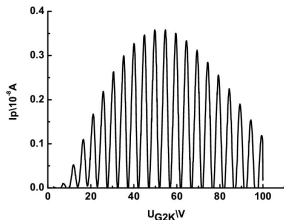
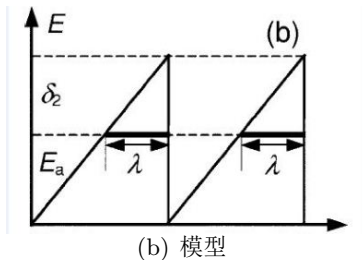
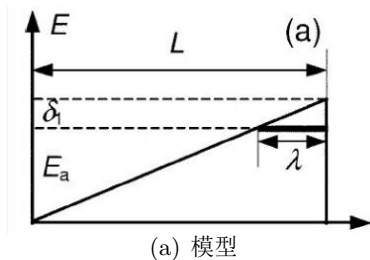
180°C的 $I_p - V_{G2k}$  曲线对谷位 $U_n$ 和序号 $n$ 直线拟合。



## 汞原子电离贡献本底电流



Am. J. Phys. 74(5), May 2006



(c) 去本底后曲线



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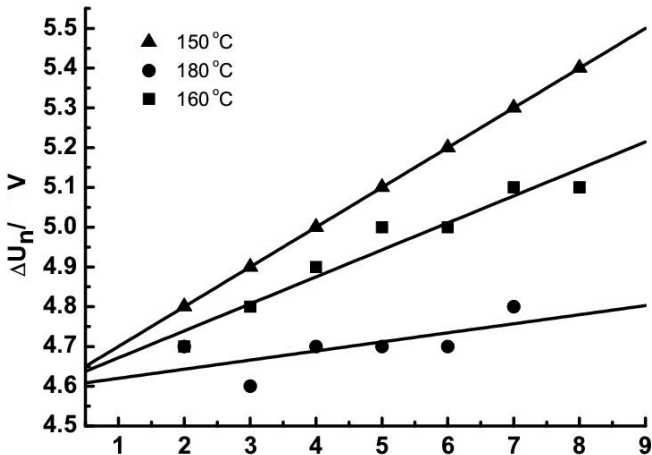
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- ▶  $\Delta E(0.5) \equiv E_a$





$$\lambda = \frac{L}{2E_a} \frac{d\Delta E(n)}{dn} \quad (7)$$

$T/^\circ C$	150	160	180
$\frac{L}{2E_a} \frac{d\Delta E(n)}{dn} / mm$	0.05	0.04	0.02
$\lambda/mm$	0.09	0.05	0.03

- ▶ 电流极大值的电压与 $6^3P_1$ 能级的激发电位有关
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- ▶ 白翠琴老师的指导和解答
- ▶ 徐迪飞同学的帮助

Thank you for your attention